

VOL. XII

OLD SERIES VOL. LXXXIX

No. 2

Medical Lib.

THE  
AMERICAN  
JOURNAL OF PSYCHIATRY

(FORMERLY THE AMERICAN JOURNAL OF INSANITY)

OCT 20 1932

UNDER THE AUSPICES OF  
THE AMERICAN PSYCHIATRIC ASSOCIATION

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HOMEWOOD, BALTIMORE  
THE JOHNS HOPKINS PRESS  
SEPTEMBER, 1932

Published Bi-Monthly

Subscription, \$6.00 a Volume

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Entered as second-class matter July 31, 1911, at the postoffice at Baltimore, Maryland, under the Act of March 3, 1879.

Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized on July 3, 1918.

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# AMERICAN JOURNAL OF PSYCHIATRY

## THE BRAIN PROBLEM—IN RELATION TO WEIGHT AND FORM.\*

By HENRY H. DONALDSON,

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A word in explanation of the title of this address is in order. To some it may seem almost too venerable and even mid-victorian. But there is a reason for it. Although some psychologists are trying to get along without the recognition of consciousness, yet I feel confident that the psychiatrists still cherish the brain as the organ of the mind.

Some 50 years ago a cry went up from the brain anatomists for "more and better brains." With few exceptions their work had been carried on with so-called "hospital material," and it was thought that if brains from those of somewhat higher mental grade could be studied, some of the bothersome questions might be illuminated. This led to the formation of anthropometric societies or similar groups among the intellectuals, whose members kindly consented to bequeath their brains for study. I dare say a number of us here have given such consent. The appeal is attractive, for it implies an interest in science and it further represents that rare form of bequest, namely, one which has not yet been taxed.

Under these circumstances the tough-minded individual is inclined to ask what can be expected from the examination of the brains thus made available. This address is intended as a reply to such a question, but is in the form of a sketch rather than that of a fully documented paper.

Interest in this brain problem has, as you know, a fairly long and highly varied history.

\*The annual address delivered at the eighty-eighth annual meeting of The American Psychiatric Association, Philadelphia, Pa., June 1, 1932.

To begin with phrenology: Franz Gall, an excellent anatomist but a most confusing philosopher, published in 1810 his opus magnum.

He associated slight elevations of the cranium with assumed elevations of the brain, and assigned a so-called faculty to each of these. On the basis of the relative development of these 26 "bumps" he proposed to read the character of the individual. Evidently this was merely transferring the current method of the physiognomist from the face to the cranium.

Fig. 1-3, taken from his original plates, show how Gall recorded the 26 bumps with which he worked.

Gall's ideas never attained any scientific standing—though they produced many reverberations among the laity.

Attention was next turned to the significance of brain weight and the interpretation of this character has occupied many students. Without asking why one brain was larger than another, it was assumed that a positive correlation existed between brain weight and mental ability, and that, therefore, outstanding personalities should have heavier brains, just as powerful men had heavier hearts. In a very general way this was true, but any inference to the effect that brain size and mental ability were directly correlated was always disturbed by the cases of large brains associated with a low mental status and small brains associated with marked mental power. There was evidently something in this notion of the significance of size, but the key to the solution of the problem was still lacking.

The failure of phrenology was followed by the general assumption that the parts of the cerebrum were equi-potential, and that various faculties were not localized, so interest turned to the convolutions of the cerebral hemispheres to determine whether their abundance and complexity might not be used as indications of intelligence.

The outstanding study of this period was that of Rudolph Wagner (1860) on the brains of three eminent scholars—Gauss, the mathematician, being among them, together with that of one Krebs, an artisan, which was used for comparison. In this study a vast amount of data is assembled and the brains are studied from several standpoints, and measured in different ways. Yet, from the complexity of fissuration, Wagner is unable to draw a definite conclusion—the fissuration is both simple and complex in brains of

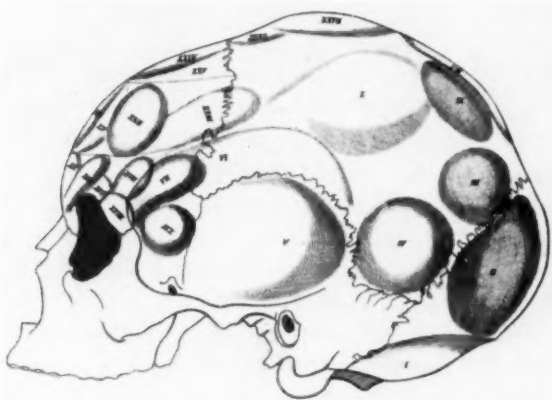


FIG. 1. —Lateral view.

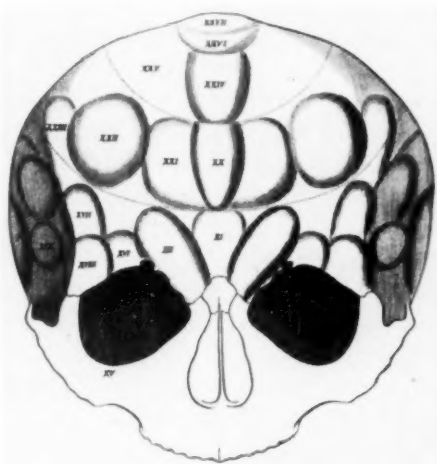


FIG. 2.—Frontal view.

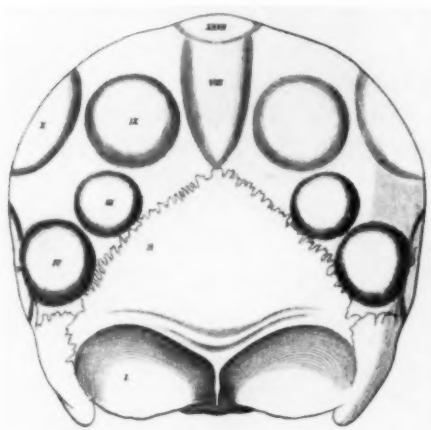
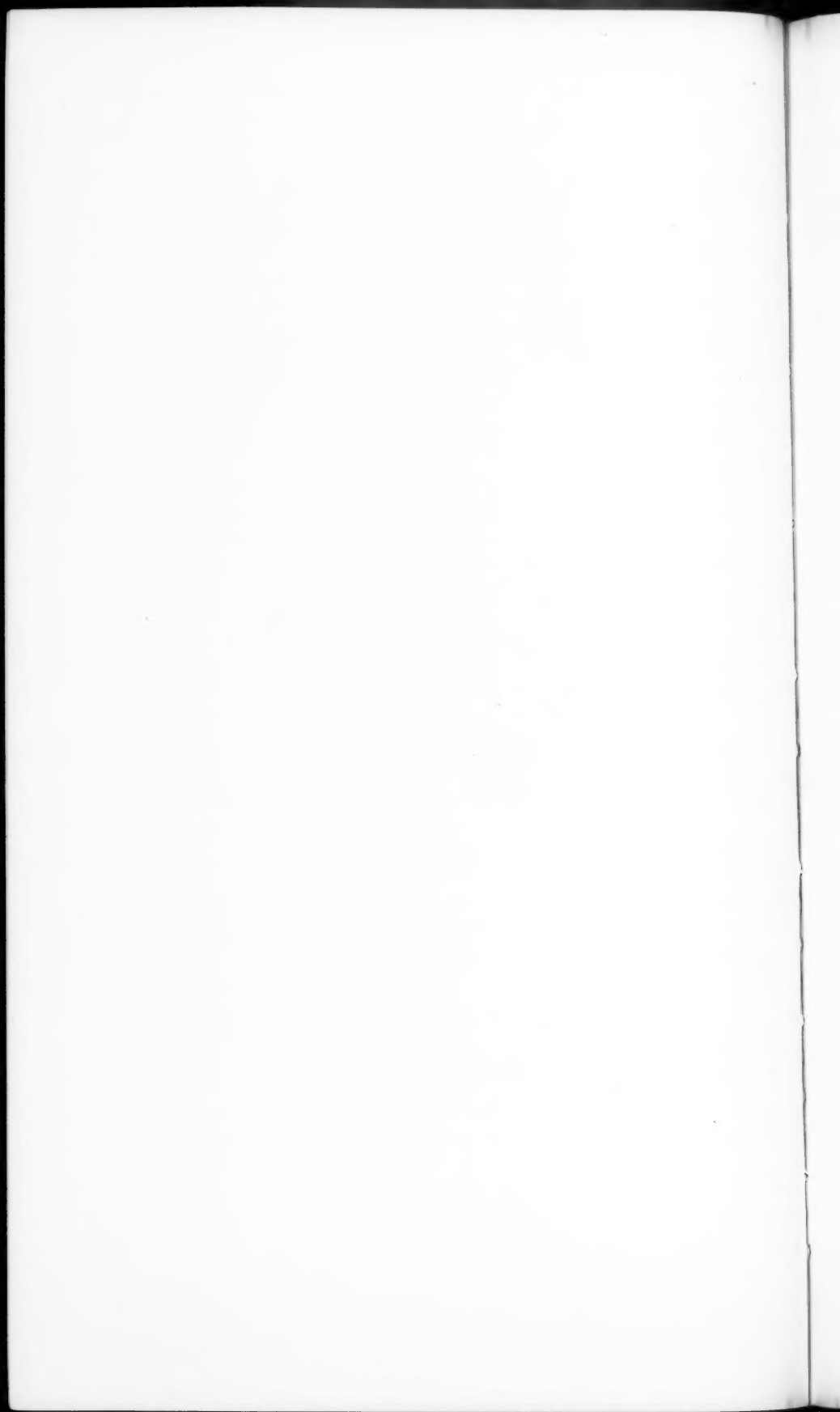


FIG. 3.—Occipital view.

Copied from Gall and Spurzheim, 1810.



the élite. As one rereads this study it appears passing strange that the conclusions of Wagner have not had more effect on modern studies, but they seem to have been forgotten.

It must be remembered that these studies were made in 1860, before the modern concept of localization was established, and before the neuron doctrine of brain structure had been demonstrated. When, after 1870, the studies on localization in the cerebral cortex were accepted, it appeared that there were two areas in the cerebrum—the parietal and the frontal—that were latent and it was inferred that in some way these were associated with the higher mental functions.

So again hope was rekindled, and the problem presented was attacked with special reference to these areas.

The literature which resulted is enormous, and represents a series of detailed investigations of great interest. When it came to interpretation, however, there was always the question of a standard for the arrangement of the gyri. Each serious investigator tended to establish his own standard with which the arrangement of the gyri in his material could be compared, consequently the results of the different studies were not comparable.

In this connection I recall the perplexity of my old friend, Burt Wilder—who was a persistent student of the cerebral pattern, and inclined to give a value to the form of fissuration—when he found the brain of Chauncey Wright, a distinguished mathematician, so poor in fissuration that it was almost infantile in appearance.

During the past 20 years the general situation has become more and more desperate, and in many laboratories there are now, on the shelf, brains of the élite left unstudied because investigators do not see clearly how anything of importance can be learned from their examination.

To illustrate just what the present situation is and to put on record some more recent observations, let us assume that we have before us the brain of one of the élite. This is to be examined in order to determine whether anything in the size, proportions or other gross characters of this brain will indicate the superior mental status of the individual to whom it belonged. By assumption this man was of average stature and thirty years of age, but the brain is 10 per cent above the average brain weight. From this brain the pia has been carefully removed and set aside. This is to be noted,



since we shall return to the pia later. The question arises: why the greater weight in this instance? It may be because the brain is composed of more neurons, or of larger neurons, the number remaining unchanged. This question is not usually raised in this connection, but is nevertheless important. Thompson (1833) computed about 10 billion cells in the cortex of the human brain. As to the constancy of this number nothing can be said directly, but there is some indirect information that does point to constancy.

When the brain weight of the wild Norway rat is compared with that of the captive Albino, it is found that the brain of the wild Norway is heavier by some 12-15 per cent. Sugita ('17-'18) has been able to determine that the cortex of the heavier brain of the wild Norway is composed of the same number of neurons as are present in the cortex of the Albino brain—but these are larger, and sufficiently larger to account for the difference in brain weight.

Thus the number of cells in the brain appears to be constant and a species character in the case of the Norway rat. I am venturing to carry this over to man, and to assume that the number of neurons in the brain is probably constant within normal limits for man also.

The greater weight of the brain we are examining is accordingly due to the larger neurons which compose it—not to an increase in their number—and this greater weight, above the average by 10 per cent, is also an instance of disproportionate growth, but such instances occur in all the parts of the body.

An interpretation of cell size is called for here, but there is nothing definite to be reported. It seems probable, however, that on the physiological side there is, in these larger cells, a greater store of energy-giving material and hence the condition for greater resistance to fatigue, while on the structural side the greater size implies a greater number of cell branches.

Assuming that the greater weight of the brain before us has been explained, there still remains the question whether this greater weight has any value as an indication of greater mental capacity. The earlier studies already noted indicated that in a very general way there is a relation between brain size and mental ability—but this is properly shown only when statistical methods are applied to large series of brains.

Fig. 4, taken from Spitzka ('07) indicates the true relations in brain weights as between those of the élite and of hospital subjects.

Two graphs are formed for the brain weights—one for a series of hospital brains, and one for a corresponding series from brains of the élite. The verticals show the number of cases for each brain

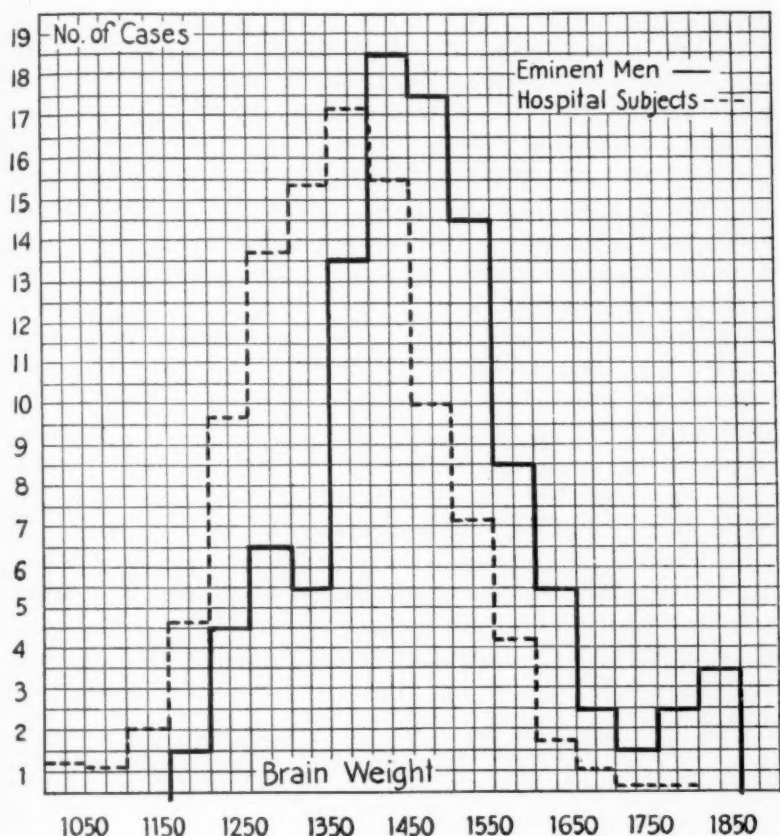


FIG. 4.—Graphs showing number of cases at successive brain weights, on the basis of 100 cases of eminent men compared with hospital subjects. Spitzka, 1907.

———— Eminent men.  
 ----- Hospital subjects.

weight in each series. It is seen that in the graph for the élite the number of cases for the lower brain weights tend to be less than those for the hospital brains, while they are greater for the higher brain weights. Thus, in the élite, the higher brain weights occur

more often, but (and this is to be emphasized) the brain weight among the élite has nearly the same range as among the hospital cases.

Similar tests may be made by using measurements of the head in the living and taking these measurements as indicators of brain size. Eyerich and Löwenfeld ('05) made such studies on both soldiers and school children. When the data were grouped in three series, according to head measurements, it appeared that the group showing the largest head measurement also showed the best mental response, while the group with the smallest head measurement showed the poorest mental response. This was the result by groups. Individually, however, high grade mental development occurred in *all* of the groups, thus giving the same relations as those illustrated in the graphs from Spitzka.

The meaning of these results appears to be that a good blood supply—both in quantity and quality—tends to bring about a larger brain during growth and a satisfactory functioning of the brain after growth is completed. However, even with a good blood supply ample growth may not follow, and thus we have the smaller brains associated with excellent mentality. This question of the significance of the blood will be considered again, later on.

If the relations thus brought out are applied to the brain before us, it is seen that the high weight of this brain suggests that the individual possessing it had a mentality above the average—but the chance in favor of this suggestion is really slight. In the individual case, therefore, brain weight is not a trustworthy indicator of intelligence.

We turn now to the next test, based on the weight relations of the parts of the brain. Here the question arises whether this greater weight is due to the more ample development of some one part of the brain, say the cerebrum. When the relative weight of the cerebrum is determined, it is found to range about 87.5 per cent, quite independent of body size, sex, age or intellectual grade. Some determinations showing this are given in Table 1.

These data certainly indicate a striking uniformity in proportional weight development of the cerebrum, but this has apparently been largely overlooked or neglected by many of those seeking for signs.

We may safely assume, therefore, that the brain before us has a cerebrum which represents about 87.5 per cent of the weight of the encephalon, despite the fact that it is overweight. What is true for

the cerebrum is also true for the cerebellum, though the individual variation seems to be greater in the case of this part.

Turning to an interpretation of these relations, if certain numbers of cells were characteristically present in the different divisions of the brain, then a proportional increase in the size of the neurons in these different divisions would bring about a constant relation in the relative weights of the parts in the larger brain. This is apparently what occurs. These results thus favor our assumption of a constant number of neurons in the human brain.

The analysis of proportional weights of parts of the brain has been carried one step further. It might be, that although the cerebrum stood in a fixed weight relation to the entire brain, yet the

TABLE 1.

ON THE PERCENTAGE WEIGHT OF THE CEREBRUM IN DIFFERENT SERIES OF BRAINS.

Observer	Superior M.	Ordinary	
		M.	F.
Wagner <sup>a</sup> .....	87.0	87.3	87.4
Boyd .....	...	87.5	87.3
Donaldson <sup>b</sup> .....	88.1	...	...
Canavan <sup>1</sup> .....	87.5	87.3	87.8
Addison .....	...	30 whites 88.0	...
Addison .....	...	27 negroes 87.4	...
Crude Ave.....	87.5	87.5	87.5

parts of the cerebral hemispheres would show different weight relations among themselves when series of brains representing different mental grades were compared.

One always has in mind the current idea that the frontal lobe is in a sense the prime intellectual center, and if so, this might be better developed in brains from the more intellectual group. The determination of weight relations between the lobes requires a very delicate and precise technique, and I am not aware that such determinations have been made on high class brains; but Mall ('09) has compared the relative weight of the frontal lobes in hospital whites and hospital negroes, and found that the proportional weight is in both series the same, thus relieving the negro brain from one deficiency urged against it, and bringing it into the line with the white brain.

There is little question, then, that the percentage value of the frontal lobe in our élite brain is like that in the other groups.

The parts of the brain then stand related in the same way in all classes of brains—and in these terms therefore, we get no indication of superiority in the brain before us.

We turn next to the cortex of the cerebral hemispheres to see whether anything there is helpful. For the weight of the entire cortex, the most trustworthy absolute values are those of Kappers ('26). In a series of three male Dutch brains he finds that the cortex represents 50.7 per cent of the weight of the hemispheres, and in a series of three Chinese brains of nearly the same weight, 50.4 per cent (Table 2).

TABLE 2.

PERCENTAGE WEIGHT OF HEMISPHERES REPRESENTED BY CEREBRAL CORTEX—  
KAPPERS.

	Brain wt. Gr.	Wt. of hemispheres Gr.	Per cent wt. of cortex
Dutch			
M. 29 yrs.....	1068	952	49.97
M. 42 yrs.....	1375	1231	48.39
M. 18 yrs.....	1360	1243	53.65
Ave. ....			50.67
Chinese			
No. 11.....	1014	907	49.30
No. 10.....	1344	1160	51.48
No. 12.....	1425	1253	50.50
Ave. ....			50.42

There is, therefore, no significant difference in the proportional weight of the cortex in the two races here compared. The influence of brain weight on this proportional weight of the cortex is also negligible.

In a corresponding series of determinations by Henneberg (1910-11) made on three German brains and three Asiatic brains of different races, the percentage weight of the cortex is 0.8 per cent higher in the German brains. Again an insignificant difference.

So far as these observations go they indicate that the proportional weight of the cortex is similar in the brains of different races, and also in the brains of different weights. The brain before us, therefore, probably has a cerebral cortex representing about



50.5 per cent of the weight of the cerebrum, and in this respect is not distinguished from brains differing in race, weight, sex or fissuration.

This determination of the weight relations of the cortex as a whole still leaves open the possibility of variations in the cortical development in the different lobes of the hemispheres. This latter determination has, however, been made in terms of area and not in those of weight.

A word touching the method used for these measurements in area may be introduced here. In 1890 I employed the method of measuring the lengths and depths of the sulci in the study of the brain of the blind deaf-mute, Laura Bridgman, mainly for the purpose of obtaining the total area of the cortex. In 1925 Dr. Canavan, at my suggestion, applied the same method to the four lobes of the hemispheres in the case of the three Southard brains, comprising the brain of Dr. E. E. Southard, the distinguished neurologist and those of his father and mother. In this instance the aim was to determine the relative areas of cortex in the four lobes. Again, in 1928, this method was applied by me, in collaboration with Dr. Canavan, for the same purpose to the brains of three scholars: G. Stanley Hall, Sir William Osler and Edward S. Morse.

For comparison with these high-grade brains Dr. Addison—with the aid of his students—has made like determinations on the hospital brains from 30 male whites and 27 male negroes. These data are still unpublished, but I am permitted to use them here. It will be helpful, I think, to take a moment to illustrate just what was measured.

Fig. 5 shows the principal sulci as seen on the lateral aspect and Fig. 6 those as seen on the mesial aspect of the brain. It was these sulci that were selected. The length of each sulcus was found and its average depth determined. The product of these values gave an area for the corresponding sunken cortex. The sum of all of these areas in each lobe was thus obtained. On the basis of the total of the areas for all four lobes the percentage value of that for each lobe was computed, and these percentage values are those used for comparison.

At this time we shall present only the data for the hospital whites and negroes, representing the low grade brains, and those for four scholars, representing the high grade brains.

Table 3 gives the percentage values for the areas in the four lobes. Attention is called to the nearly constant values for the

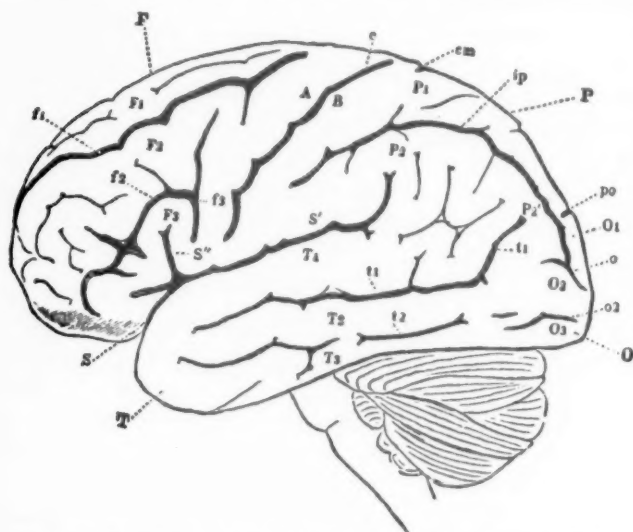


FIG. 5.—Schematic lateral view of the cerebral sulci—Ecker.

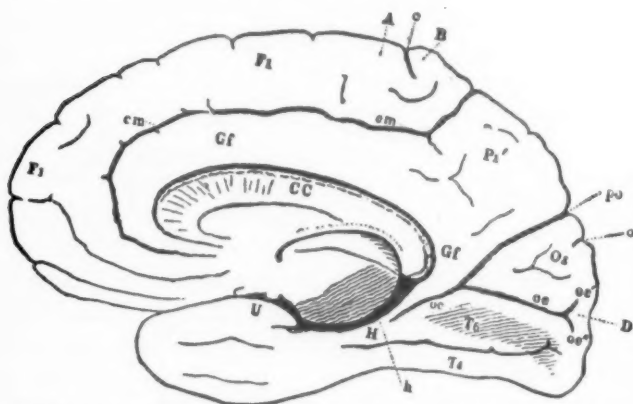


FIG. 6.—Schematic mesial view of the cerebral sulci—Ecker.

frontal areas and to the similarity in all series for the sum of the parietal and temporal areas.

Fig. 7 shows the graphs based on these values for the four lobes.

You note that the graphs for the hospital whites and negroes are nearly identical, while the graph for the four scholars deviates

TABLE 3.

PERCENTAGE VALUES FOR THE CORTICAL AREAS IN THE SCHOLARS BRAINS  
COMPARED WITH THOSE IN THE BRAINS OF HOSPITAL  
WHITES AND NEGROES—ALL MALES.

P+T=Sum of values for the parietal and temporal areas.

Scholars	Lobes			
	Frontal	Parietal	Temporal	Occipital
4 M.....	38.80	31.66	20.47	9.07
		P+T=52.13		
Hospital brains				
30 whites M.....	37.79	38.25	14.33	9.63
		P+T=52.58		
16 negroes M.....	38.40	38.60	14.10	8.90
		P+T=52.70		

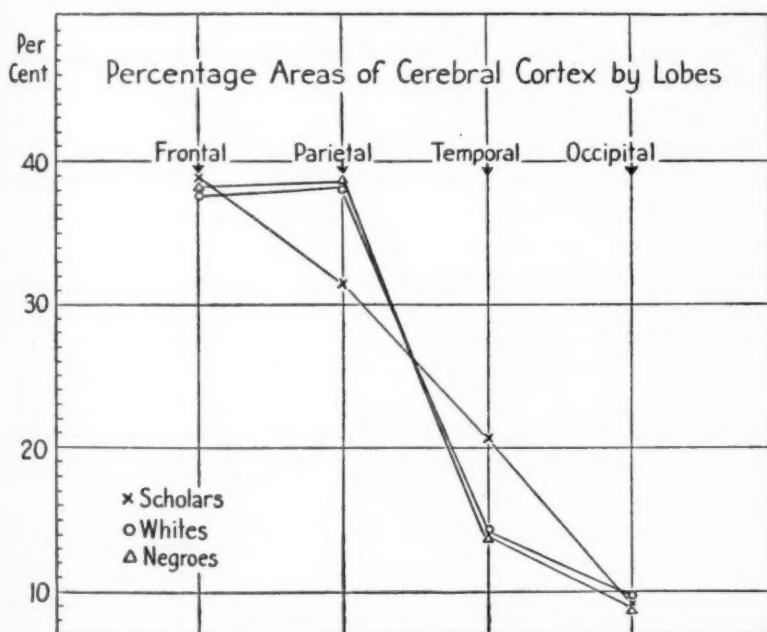


FIG. 7.—Graphs showing the percentage values for the cortical areas of the frontal, parietal, temporal and occipital lobes, respectively, in the brains of the élite, of hospital whites, o, and of hospital negroes Δ.

from them in the case of the parietal and temporal areas. This deviation will be considered in a moment, but first I desire you to observe that in the graphs the area values for the frontal lobes are nearly the same in all three series. Thus in the case of the frontal lobes the cortical development in area shows no significant excess in the high-grade brains, and the fact that the areas are similar in the hospital whites and negroes ties up with the observation that the relative weights of the frontal lobes are similar in these two races.

It was noted a moment ago that the graph for the scholars' brains did not follow those for the other series. Curiously, the deficiency in the parietal area is almost exactly balanced by the excess in the temporal, and if a three point graph is made, giving respectively the areas for the frontal—the parietal and temporal combined—and the occipital, it is seen that the agreement is almost perfect.

These differences which appear in the parietal and temporal areas of the scholars' brains are explained in the following manner :

The data for the areas in the scholars' brains were obtained from measurements by Dr. Canavan—while the corresponding data for the hospital brains from whites and negroes were from measurements by Dr. Addison. As the method for measurement is a delicate one, and may be influenced by the personal equation of the operator, it was deemed possible that the differences shown by the scholars in the parietal and temporal areas might be due to differences in method. A remeasurment of one of the scholar's brains by Dr. Addison shows that such is the case. We conclude, therefore, that when measured by exactly the same technique, the parietal and temporal areas would have like values in all the series—and as a consequence brains of the élite are not to be distinguished from hospital brains by the relative extent of the cortex in the frontal, parietal, temporal and occipital lobes. With this result the brain we are testing would most probably agree.

Thus the imaginary brain before us has been examined in relation to several characters. Its greater weight is a slight suggestion merely that it belongs to the higher grade, but the proportional weights of the parts—the relative weight of the frontal lobes, the weight of the entire cortex, and the relative values for the cortical area of the four lobes—do not differentiate it from ordinary brains.

These results make us sympathetic with Wagner when, after a laborious study of the brains of several eminent scholars in 1860,

he concludes: "It is not only the duty of science to discover new facts, but also clearing the scientific field of fictions and errors belongs to the prescribed obligations of the investigator."

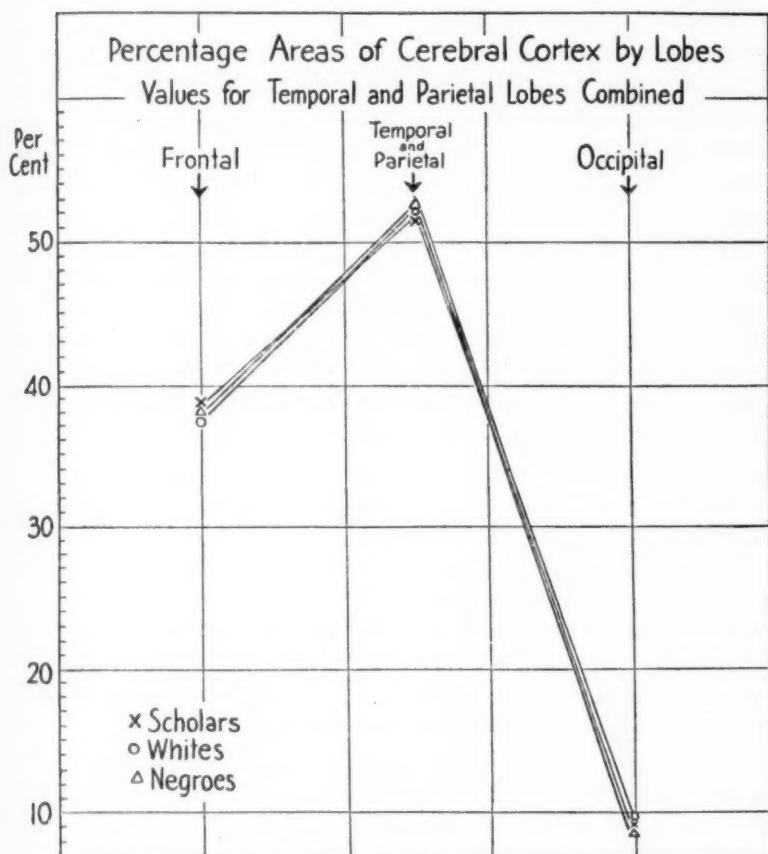


FIG. 8.—Graphs showing the percentage values for cortical areas in the frontal—parietal and temporal combined—and occipital lobes, respectively, in the three series of brains here compared. Elite, x; whites, o; negroes, Δ.

This outcome is unfortunate in one way, for when the friends of some distinguished individual present his brain for study by the current methods, there seems to be a feeling that if nothing significant is reported, the fault lies in the anatomist rather than in the brain. Plainly, this is an instance where the diffusion of knowledge would be helpful.



Such is the first chapter of this story—and we pass now to a consideration of the problem presented, from another point of view.

As assumed, the superior individual under consideration showed, during life, more than usual mental ability, and there must be somewhere a reason for this.

So far we have considered the brain only after death—when it is an organ at rest—for the driving power is lacking. Broadly speaking, this driving power which puts it to work during life is the blood, and the conditions determining the supply of blood are fundamental. The best of brains makes a poor showing in a fainting individual.

But still other conditions are to be kept in mind. On the structural side, both the vascular tree which conveys the blood to the brain, and the histological complexity of the neurons, which probably varies from person to person, must be taken into account, while physiologically the chemical constitution of the neurons—also highly variable—together with the abundance and composition of the blood, bearing as it does contributions from every part of the body—are again factors in determining the final activities of the brain. Of these several factors only two have been sufficiently studied to justify consideration here.

Let us begin with the vascular tree. It was pointed out, as you will recall, that the pia had been carefully removed from our imaginary brain, and set aside for consideration later. This was done with a very special purpose, for recent studies have shown that the vascular tree, as represented in the pia, is a highly variable structure, and that its variations are significant.

Hindzé (1926-31) has made a study of the vascular tree as shown in the pia, from both mentally superior and ordinary individuals, and has found a positive correlation between the complexity of the vascular tree and the mental grade. Here is something measurable and of fundamental importance.

Fig. 9 shows the vascular tree in the pia from the brain of a hospital patient.

Fig. 10, the same, in the pia of a distinguished Russian neuropathologist.

These are merely illustrative samples, and ultimately this study must be carried on by statistical methods in order to determine the exact relations.

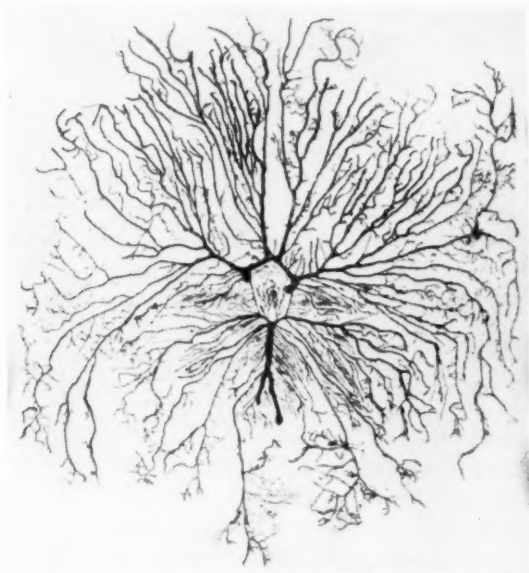


FIG. 9.—Vascular tree in the pia of a hospital patient—Hindzé, 1926, Fig. 5.

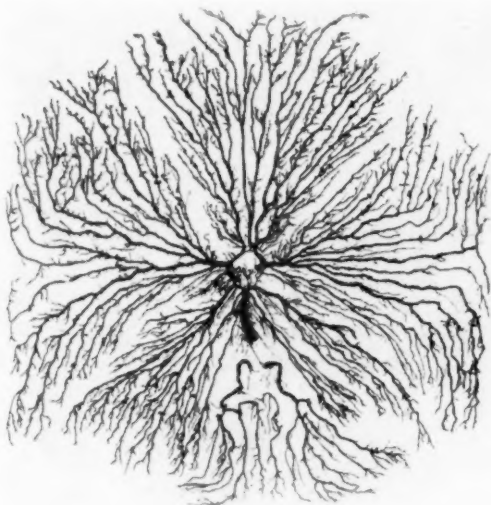
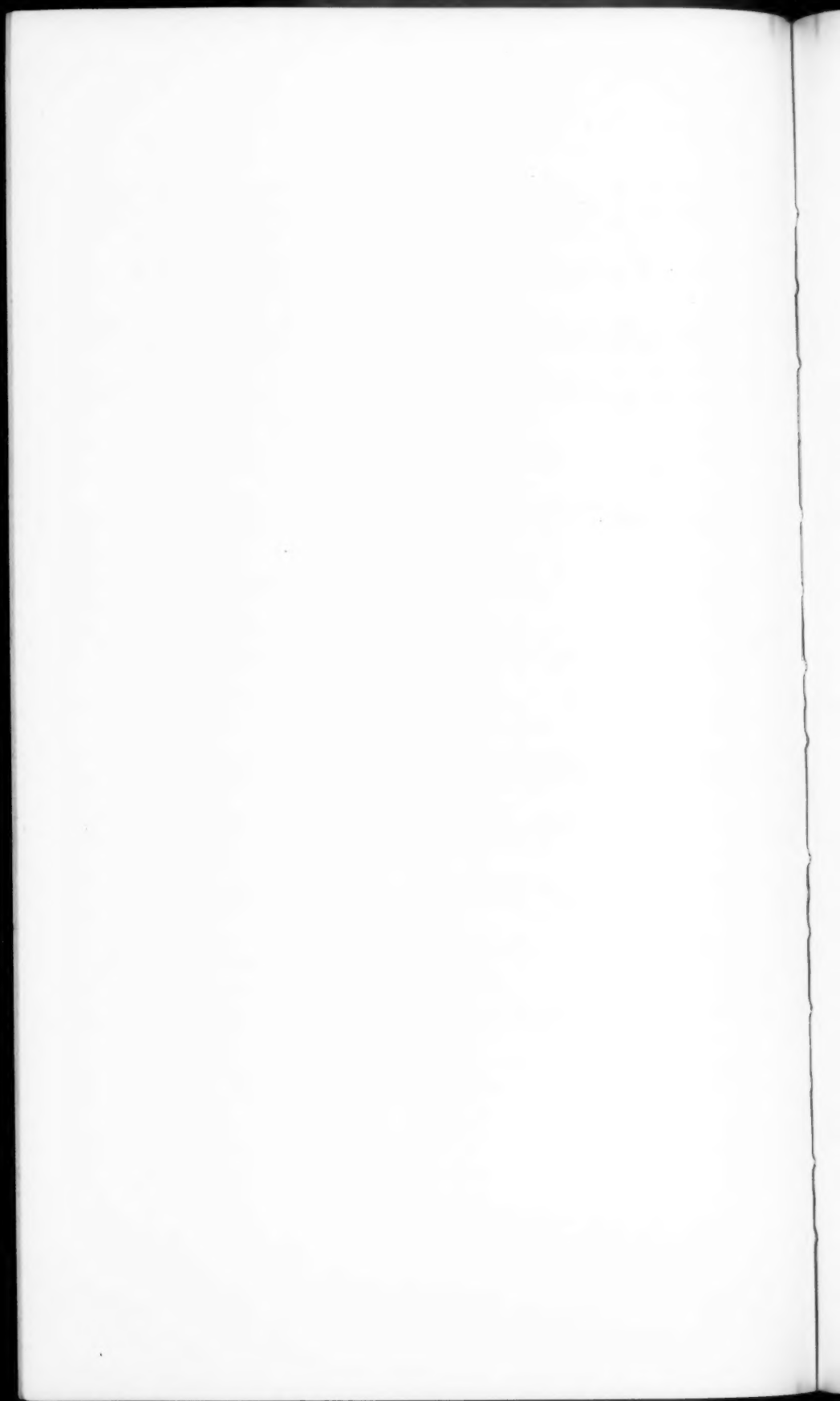


FIG. 10.—Vascular tree in the pia of a distinguished Russian neuropathologist—Hindzé, 1930, Fig. 3.



Of course, variations in the vascular tree do not give directly the relative abundance of the small vessels surrounding the nerve cells themselves, but the inference is safe that the external and internal blood supplies are highly correlated, and there is no question that the brain, like a muscle, works better with an ample blood supply. There can be little doubt that the brain before us was well supplied with blood.

So at last we have a partial reason why one brain works better than another. Individual variations in the structural complexity and in the chemical composition of the neurons in normal individuals play an important rôle, without question, but at present there is nothing in this field to report.

On the bio-chemical characters of the blood advances have already been made. Common observation indicates how, in the same person, excitation or depression may occur, and the various forms of intoxication, with their characteristic mental symptoms, may be induced. In the field of colloid chemistry studies of fundamental importance from a clinical standpoint have been contributed, especially by Haldi, by Ludlum and by Bancroft, with their respective collaborators. Based on the studies of botanists and histologists on the nature and behavior of protoplasm, their results show that through the blood the status of the neurons can be widely altered, as indicated by the agglomeration or dispersion of their substance, and this response is a reversible process.

As a consequence of this reversibility the status of the neurons can be controlled, and with alteration in status the mental processes show a corresponding range of change. Such control marks a great step forward.

To follow the details of these studies does not belong to this presentation, and further, would be beyond me; but these most important observations are here noted for their bearing on our general argument concerning the significance of modifications in the physiological status of the neurons as they may occur in the normal individual.

Permit me a few words in summary.

My main purpose was to consider whether there were signs of functional capacity to be found in the post-mortem human brain. Reasons were adduced for regarding the number of neurons composing the human brain as fixed within biological limits, and as

characteristic for the species. Brains of greater weight are therefore regarded as composed of larger neurons, and this enlargement, where it occurs, is proportional in the different parts of the brain, so that the weight relations of the parts remain approximately constant.

As a result, then, of the foregoing study, no method of assorting brains on the basis of weight, proportions of parts or the weight or proportional areas of the cerebral cortex in the several lobes, serves to classify them according to intellectual capacity. So much for the dead machine when examined by the different methods of gross anatomy.

If, however, we change our mode of attack and approach from the side of the nutrition of the brain, the situation is altered. It appears that the vascular tree, represented by the vessels in the pia, is better developed in the intellectuals. This apparently means a better blood supply to the cortex, and it is unquestioned that such would contribute to a better performance.

Finally, variations in the composition of the blood serve to modify the activities of the neurons—and though the evidence is at present from the field of pathology, it is a fair inference that for individuals falling within the bracket called “normal,” blood composition may be a significant factor in determining the grade of mental processes.

In several instances studies on the histological structure of the cortex in normal brains have been made, though the data have not yet been put on a sound statistical basis. Nevertheless, in this direction further progress is to be expected.

To conclude: No signs of functional capacity are to be found in the dead brain, as represented by the imaginary specimen before us, save that size, in a general way, indicates good growth—a favorable sign. If we pass to the pia, however, the ample development of the blood tree does show that the brain was unusually nourished, and this well-developed blood tree appears to go with the brains of those who during life were notably able.

Although, in the solution of the brain problem, our advance has thus far been only moderate, yet the future is not without prospects for further progress, especially by the aid of bio-chemistry and histology, which methods may render possible finer distinctions between brain and brain.



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## CRIME AND THE ENDOCRINE GLANDS.\*

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In 1929, for the first time in the history of the American Republic, its President, Herbert Hoover, appointed a commission to investigate the prevalence of crime in the United States. This commission, which became known as the Wickersham Commission, recently published its final report. In effect, the report is a summary of how deeply crime has infiltrated American society and of how progressively enfeebled have become the efforts of the so-called forces of law and order in eradicating or even controlling it.

The facts may indeed be said to be notorious. In the most populous cities of the country, New York and Chicago, special commissions of inquiry have exposed some of the more sordid details of alliance between apprehended and unapprehended criminals. Scores of books have been published dealing with the criminal as a character in novels, the detection of crime, gangs and gangsters. The large moving picture producing corporations have spawned a brood of stories dealing with the exploits of criminals. Every phase of criminal activity has been presented upon the stage, all ostensibly with a moral purpose. The racketeer has become the most prolific source of news for the journalist. And when there appeared a large octavo biography of Al Capone, the most successful and richest racketeer in the nation, *Time*, the news weekly, printed his photograph upon its front page as one of the distinguished figures of the age.

According to the twelfth report of the Wickersham Commission, made public on August 21, 1931, it costs the people of the United States more than a billion dollars every year, officially, to combat crime. This billion dollars consists only of such grossly available items of expenditure the investigators of the commission came upon during the relatively limited time they devoted to their study. Directly or indirectly connected with crime many other items of

\* Read before The Society for Medical Jurisprudence, Academy of Medicine, New York City, November 9, 1931.

cost must run into hundreds of millions of dollars. As these could not be accurately gauged, they were simply listed and their nature analyzed.

Although it emphasized the cost item, the commission also emphasized that "it should not require the dramatic effect of some lump sum total figure to emphasize the importance and necessity from a purely economic standpoint of dealing adequately with the problem of preventing crime, and controlling the criminal." At the same time the report stressed "the tremendous economic burden imposed by crime upon the community." Among items not estimatable were catalogued: undetected security frauds, credit frauds, confidence games, forgery and counterfeiting.

Some of the figures are sufficiently impressive to be worth mentioning as indicators of the price communities pay for permitting crime. A sum of one quarter of a billion dollars is spent annually by the 300 larger cities of the country in dealing with the crime problem. Eleven states expend more than \$2,500,000 yearly for their police forces. Prisons, the penal and correctional institutions, require an outlay of more than \$50,000,000 every twelve months.

Besides these expenditures of the taxpayer's money, large private budgetings are made for protection against criminals. Almost \$4,000,000 is handed annually to companies engaged in providing armored cars for the movement of valuables and money. Insurance paid out for the criminal losses of burglary, larceny, robbery and embezzlement, amounts to almost \$50,000,000. More than \$106,000,000 was paid for legitimate insurance against criminal acts. Organized frauds perpetrated through the mails brought to the attention of the Post Office Department came to \$68,000,000. Says the report, "We believe that this represents only a small portion of the total loss due to criminal frauds, and we think it quite probable that the loss due to organized extortion and racketeering is of still greater magnitude."

Another tremendous incalculable sum is that due to loss of the productive labor of the large criminal population. Combined with that, the loss of productive labor of those engaged in enforcing the law and in apprehending and convicting criminals was put at about \$300,000,000.

The largest item of expense in the administration of municipal criminal justice was found to be the police, being almost \$200,000,000. In 1930, New York City paid 14 per cent of its entire city budget for criminal justice. Jersey City, just across the Hudson, contributed more than 18 per cent. To this \$200,000,000 should be added \$159,000,000 paid annually for watchmen by various industries, mercantile establishments, and private institutions. No estimate was provided of payments for private detective service. But for the last ten years, ten millions have been spent annually for their protective devices, such as burglar alarms, police call instruments and the like. About \$4,000,000 was expended for safes, chests and vaults.

From 1904 to 1928, according to federal census figures, the number of prisoners in federal and state prisons and reformatories has increased from 57,070 in 1904 to 106,517 on January 1, 1928. In other words, in twenty-five years, or one generation, the number of criminals has practically doubled.

FEDERAL CENSUS OF THE TOTAL NUMBER OF PRISONERS IN  
STATE AND FEDERAL PRISONS AND REFORMATORIES.

1904.....	57,070
Jan. 1, 1910.....	68,735
Jan. 1, 1923.....	81,959
Jan. 1, 1926.....	91,669
Jan. 1, 1927.....	98,245
Jan. 1, 1928.....	106,517

NUMBER OF PRISONERS IN STATE AND FEDERAL PRISONS AND  
REFORMATORIES PER 100,000 POPULATION.

1904.....	69.1
Jan. 1, 1910.....	74.7
Jan. 1, 1923.....	74.0
Jan. 1, 1926.....	80.6
Jan. 1, 1927.....	85.2
Jan. 1, 1928.....	91.4

A majority of these are recidives, second and third offenders, the habitual criminals who are the real, chronic, typical crime problems of society. In the last ten years, the number of those whom society has not succeeded in incarcerating, has been estimated as being from half a million to a million. Of these many are still

adolescent youths and women. Eighteen to twenty-five is the age period that has shown the most shocking percentage increase of criminals.

Now what is the human cost, the cost in terms of human suffering, degradation, degeneration, misery and disease? We have no units, no standards of measurement of these items, intangible, but infinitely more real. Shall we say that trillions of trillions of pounds of pain, emotional torture, anxiety, horror and fear were involved and are involved in the daily commission of those acts by which man injures man and, in so doing, himself?

One of the investigators for the commission, Morris Ploscowe, has stated some of the elements contributing to the chain of the human cost, beginning with the child and the family and its environment. He called attention to the report of the New York Crime Commission, published in 1928, that the study of 145 inmates of the Elmira and Sing Sing prisons revealed that a majority of those from Greater New York came from six congested slum districts of the city. That commission then made it one of its provisional conclusions that isolated slums are the brood nests of robbers, burglars, and thieves. This conclusion would fit in with the data provided from another source, once analyzed by the present speaker, that the morbidity of disease and the death rate due to disease was much greater in the slum areas than in the other divisions of the great city. Ploscowe, however, analyzing all the available data, modifies this conclusion considerably by his finding that although the lowest economic classes contribute a large proportion of the criminal population, their contribution is not very much greater than might be expected from their ratio to the total population of either city or country. In other words, poverty is not as important a factor in the genesis of crime as has been suspected and proclaimed.

What is crime? What causes crime? What should be our normal attitude towards crime and criminals? How should we react to crime? What shall we do about our criminals? And can crime be prevented to any important extent?

In seeking for an answer to these questions, a definition, a clear working conception of crime must be obtained. We come immediately upon the obstacle of the variability of the various actions and behaviors which are collectively labeled under the heading of crime.



Technically, crime consists in the breaking of certain laws which constitute the penal code. Actually there are distinguishable three different classes of criminal behavior. These are classifiable as statutory crime, occasional crime and essential crime.

Statutory crime is crime which is so designated by the fiat of the law. A legislature may take any act, hitherto considered innocent or even beneficial, and declare it criminally penalizable. By a mere transference of category of classification, a taboo, a notice of forbiddance, is placed upon the act and prison yawns for the transgressor. The most well-known and typical example of such statutory crime is the Prohibition Law of the United States. The Jones Act made it a crime to transport liquor, whereas twenty years ago, such fluids were being regularly delivered to the White House itself. The perpetrator of a statutory crime cannot be considered a criminal in the most acceptable sense of the word. This is recognized by judges who often substitute a fine for incarceration, in punishment for it. Political crime, acts of plotting against the state or concocting treachery against it, are generally most severely punished even though they are only a form of statutory crime, because of their threat against the safety of the organized society. Statutory crime does not come within the purviews of our problem.

Occasional crime is the name that might be given to actions in which true crimes are committed under extraordinary circumstances, abnormal conditions, or extreme temptation. A man who in a time of widespread unemployment and general starvation steals a loaf of bread to feed his children is the classical type. Occasional crime may be said to be crime perpetrated by individuals who could withstand the normal range of stress under normal conditions, but who yield when the strain becomes unendurable. Such persons perform the criminal act only once, rarely more, abstain and do not repeat as soon as the abnormal condition is corrected, or take care not to fall into situations when the commission of the crime again becomes a possibility. Such behavior does not really belong to the domain of crime, for it is more accident than misbehavior, and its prevention involves the technique of the prevention of all accidents.

Essential crime is what we are concerned with. By essential crime is meant crime in the true sense of the word, conduct which involves personal injustice and injury consciously and deliberately



perpetrated. It is the kind of anti-social behavior which causes men to organize to punish it and to prevent its repetition. It involves an element of aggression and an intent of evil. It threatens the well-being of the body-social and its constituent members as does an epidemic of infection or a natural calamity. In the elementary forms, murdering, kidnapping, stealing, swindling, it is as easily recognized as the elementary forms of disease: deformity, trauma, fever or tumor. In a metaphorical sense, certainly, such crime is a disease arising in some portion of the corporate body of society.

Now the Wickersham report includes 6000 pages or 1,400,000 words dealing with the problem of essential crimes in the United States. Yet the upshot of it all is that nothing of importance has been established that can be applied to either the treatment or prevention of crime. What light can the methods used by modern medicine in approaching problems of personality throw upon the problem?

It is by now a fairly well-known generalization that the endocrine glands are the regulators of metabolism and thereby the regulators of personality. All disturbances of the endocrine glands are accompanied by disturbances of personality. And all those who investigated disturbances of personality with the apparatus of metabolism studies have found disturbances of metabolism and often disturbances of the glands of internal secretion. From the time of Lombroso, great efforts have been expended by various investigators in an attempt to establish the nature of a constitutional factor in crime, but without success. Modern studies of the qualities of human constitution and personality have established their inheritance through the genes in the chromosomes of the germ plasm. It has also been demonstrated that these genes act through the endocrine glands, the glands of internal secretion. A wealth of evidence has established these two laws of constitution.

But to clinch the whole conception of the relation of the endocrine glands to constitution and personality, the most recent evidence has proven that an inherited genal or chromosomal defect may be corrected by appropriate glandular treatment. Thus (Carrol Birch has shown) the disease, hemophilia, in which the blood does not coagulate properly, so that the individual suffering from it is always in danger of bleeding to death, is the most typical of con-

stitutional diseases. It is inherited along Mendelian lines, being transmitted through the female, but not manifested by her. The symptoms appear only in the male. Now Birch has shown within the last few years that the pathological condition, the incoagulability of the blood, may be corrected by the injection of ovarian extract into the suffering male. She also showed that the blood of the normal male contains a certain minimal amount of units of the ovarian hormone, while the hemophiliac contains none at all. These findings confirm the conception that inherited defects of bodily constitution may express themselves in disturbances of the glands of internal secretion, the correction of which with proper glandular extracts will serve to correct the defect of constitution.

For the psychologist, the psychiatrist, the educator and the jurist, the most general law that can be stated concerning the endocrine glands is that they affect the emotional life of every individual, in that they affect the rate, the intensity, the persistence and the relation of the fundamental *instinctive drives*: fear, anger, hatred, sexual or possessive desire, sociality and sympathy. All behavior therefore is powerfully influenced by them.

It may be safely said that the endocrine glands, through their hormones, influence personality by their effects upon all the organs and parts of the body in general, and of the brain and nervous system in particular. It is now universally agreed that behavior, normal or abnormal, is mediated through the brain and nervous system. Thyroxin, parathyrin, adrenalin, cortin, the thymus hormones, the gonadal or sex hormones, the pituitary hormones, the pineal hormone, all have their fundamental effect upon the statics and dynamics of the personality through their effect upon the nervous system. The thyroid gland with thyroxin heightens the excitability of the brain and the nervous system. A lack of thyroxin produces a slowing of the perceptions and reactions, a certain stupidity. An increase of the thyroxin increases the speed of reaction of the nervous system. A lack of parathyrin, the hormone of the parathyroid glands, produces an increased sensitivity of the nerves, so that the nerves will respond to a stimulus, mental or physical, that is 1/1000 the strength of the reaction necessary for a normal response. This is associated with a lack of ionized, that is metabolically usable, calcium in the blood and tissues. An excess of parathyrin is associated with an insensitivity, a lack of reaction

to stimuli and situations that would disturb a normal person. The adrenal glands produce at least three different kinds of hormones: one is adrenalin, which has been known for a relatively long time to act upon the sympathetic nervous system, stimulating its endings and centers, and evoking a tendency to excessive emotional response. A lack of it produces apathy and emotional inertia and lethargy. The other internal secretion of the adrenals, produced by it, and variously designated as interrenalin, cortin, intercortin, and so on, has a profound effect upon muscles and the reflexes of the nervous system. A lack of it, as has recently been shown by Hartmann, causes an early exhaustion of reflexes, an excess of it, results in a tendency of them to persist. Another hormone of the adrenal cortex influences sexuality. The pituitary gland is involved in nervous and brain reactions both through its prepituitary portions and its post-pituitary. The post-pituitary, as has been shown by Cushing and others, has, through its hormones, an action upon the sympathetic nervous system opposed to that of adrenalin—it is, in effect, a stimulant of the vagus system. And we must conceive of the sympathetic-vagus nervous system as maintained in a state of balance by the adrenalin-pituitrin antagonism. The prepituitary or anterior pituitary gland influences the growth and development of the brain and nervous system through its growth hormones, while through its sex hormones, which regulate the growth development and functioning of the reproductive system, it influences what may be called the erotization of the nervous system, which has so profound an influence upon personality and character. The thymus gland, through its hormones, also influences calcium and phosphorus metabolism. It has a curve of development which runs inversely to that of the sex glands. Its enlargement in a series of murderers was reported as long ago as 1920 by Morris. But its enlargement or reactivation should not be looked upon so much as a direct cause of metabolic disturbance, but as a sign of perversion of the normal evolution of the endocrine glands which should accompany the maturation processes of childhood and puberty. It has a definitely proved relation to the adrenal and sex glands. Lastly, as regards the pineal gland: although it was regarded as the seat of the soul by Descartes, little or nothing is known of its metabolic centers, yet the effects of its disease during childhood, producing the syndrome of macrogenitosomia præcox,

make it certain that it must play some fundamental rôle in metabolism and brain functioning.

The criminal represents a distinctive type of personality, a definite variety of abnormal personality. If the scientific hypothesis is valid, that different types of personality, normal and abnormal, are expressions of different degrees of functioning of these endocrine glands and their hormones, then the criminal personality should be a resultant of an abnormal functioning of the endocrine glands. If criminality is associated with and dependent upon abnormal instinctive drives produced by abnormal endocrine glands, then we should expect to find four conclusions from an investigation of them:

1. That disturbances of the endocrine glands are found much more frequently in a criminal population than in a normal population.
2. That certain types of crime should be associated with certain types of glandular malfunctioning, in relation to what we know of the action of the specific hormone.
3. That it should be possible to modify, palliate, or even completely abolish criminal behavior by means of correction of the discovered glandular malfunctioning.
4. That it should be possible to prevent the development of criminal behavior by preventing the development of glandular disorders and malfunctioning in infancy, childhood and adolescence, or even by the correction of inherited glandular disturbances during these early age periods.

There has been much valuable speculative theorizing in this field and suggestive reports of individual case histories. There is quite an extensive literature. But no one has ever reported a sufficiently large number of criminals, investigated with the most modern methods of studying the functioning of the individual endocrine glands, and compared with a control group of almost the same number and age period.

The writer began his investigations about three years ago with the idea of making a definite, detailed, systematic study of the condition of the different endocrine glands in juvenile delinquents and criminals, and comparing the findings with those of a fairly normal segment of the population of a similar age period. The work on convicts was carried out for a period of nine months in the premises and laboratories of the Classification Clinic of Sing Sing

Prison and several private institutions. The controls were healthy individuals who were leading a normal life of activity and who presented no obvious evidence of physical or mental abnormality, of about the same age periods.

Each of the individuals examined was given a thorough physical examination to exclude the presence of organic, non-endocrine disease. No one with organic disease was included in the group now to be reported. The incidence of organic disease, such as heart disease, tuberculosis, chronic sinus disease, Bright's disease, etc., was extremely low in the series of normal individuals selected at random for the purposes of examination. A thorough examination was carried out for signs of disturbed function of the endocrine glands, together with tests of metabolism and a determination of the blood chemistry. Our purpose was to establish, if possible, the presence or absence of a basic metabolic disturbance in these criminals dependent upon a malfunctioning of the endocrine glands. Basal metabolism tests were carefully carried out. A study of the blood chemistry was made in relation to those constituents of the blood which are known to vary with changes in the endocrine glands. X-ray examinations were made of the skull and pituitary fossa, of the chest for the status of the thymus gland, and of the hands and other parts of the body to observe the state and evolution of ossification. And in addition a search was made by physical examination for the clinical signs and evidence of the functional efficiency of each endocrine. These are methods that are now more or less standardized and in use in endocrine clinics and researches throughout the world.

The results are best presented in the form of the following tables:

TABLE I.

## TYPES OF CRIME BASED ON STUDY OF 250 CRIMINALS.

Robbery and burglary.....	126
Grand larceny .....	46
Petty larceny .....	20
Murder .....	16
Fraud .....	10
Forgery .....	7
Manslaughter .....	4
Rape .....	4
Arson .....	3
Assault .....	3

TABLE I.—CONTINUED.

Pander .....	3
Abandonment .....	2
Abduction .....	1
Bigamy .....	1
Sodomy .....	1
Desertion .....	1
Carrying weapon .....	1
Incest .....	1
	<hr/> 250

TABLE II.

BASAL METABOLISM IN 250 CRIMINALS COMPARED WITH 280 NORMALS OF ABOUT THE SAME AGE PERIOD.

## METABOLISM.

Criminals.					Control group of same age period.				
	Plus.	Per cent.	Minus.	Per cent.		Plus.	Per cent.	Minus.	Per cent.
0- 5...	46	18.4	37	14.8	0- 5...	82	29.2	48	17.1
5-10...	48	19.2	15	6.0	5-10...	76	27.1	42	15.0
10-20...	44	17.6	13	5.2	10-20...	15	5.3	10	3.4
20-30...	6	6.4	13	5.2	20-30...	6	2.1	..	..
Above30	18	7.2	..	..	Above30	1	..	..	..
	172		78			180		100	

TABLE III.

## BLOOD BIOCHEMICAL DATA.

	Criminals. Per cent.	Control group. Per cent.
Excessive non-protein nitrogen.....	52	15
Low sugar .....	48	12
High uric acid.....	32	5
High cholesterol .....	55	18

Table IV.

## RADIOGRAPHIC DATA.

## MEASUREMENTS OF SKULL AND SELLA TURCICA.

Ratio of Length of Sella Turcica to Depth of Sella Turcica.

	Criminals. Per cent.	Control group. Per cent.
Less than average.....	51	22
Average .....	44	66
More than average.....	5	20



TABLE IV.—CONTINUED.  
Ratio of Length of Sella Turcica to Length of Skull.

	Criminals. Per cent.	Control group. Per cent.
Less than average.....	68	10
Average .....	12	66
More than average.....	20	24

TABLE V.  
OUTSTANDING ENDOCRINE CONDITIONS IN 250 CRIMINALS.

	Criminals. Per cent.	Control group. Per cent.
Thymus		
Thymus enlarged .....	66	20
Definite status thymico-lymphaticus.....	35	12
Parathyroid		
Deficiency marked .....	38	10
With mild .....	50	14
Thyroid		
Enlarged .....	57	19
With definite signs of hyperthyroidism.....	33	10
Prepituitary		
Deficiency .....	46	18
Post-pituitary		
Deficiency .....	38	12
Adrenals		
Deficiency .....	38	5
Excess .....	26	8
Gonads		
Deficiency .....	42	15

TABLE VI.  
TYPES OF CRIME COMPARED WITH ENDOCRINE IMBALANCE.

Robbery and burglary...	Pituitary — and Parathyroid —
Grand larceny .....	Parathyroid — — —, Thymus + + +, Pituitary — —, Thyroid + + +
Petty larceny .....	Parathyroid — — —, Thymus + + +, Pituitary — —
Murder .....	Thymus + + + +, Parathyroid — — —, Adrenal + +, Thyroid +
Fraud .....	Thyroid + +, Parathyroid — —, Pituitary — —
Forgery .....	Thyroid + + +, Thymus + + +, Parathyroid — — —
Rape .....	Thyroid + + + +, Gonad + + + +, Pituitary —
Arson .....	Thymus + + +, Parathyroid — —, Pituitary — —
Assault .....	Adrenal + + + +, Thyroid + + + +, Pituitary —, Gonad —



TABLE VII.  
THE GESTALT CONCEPTION OF CAUSATION.

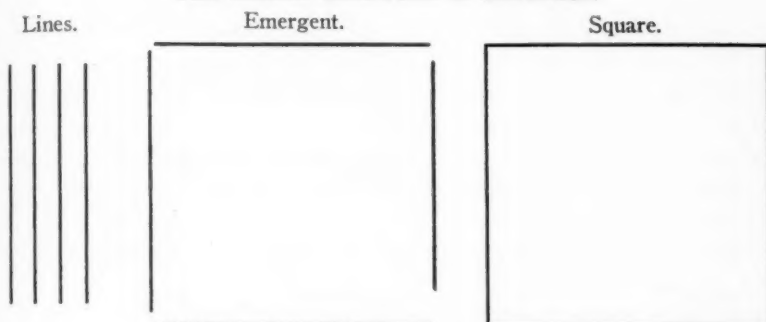


TABLE VIII.  
THE GESTALT CONCEPTION OF THE CAUSATION OF TUBERCULOSIS.  
Bacterium of tuberculosis.

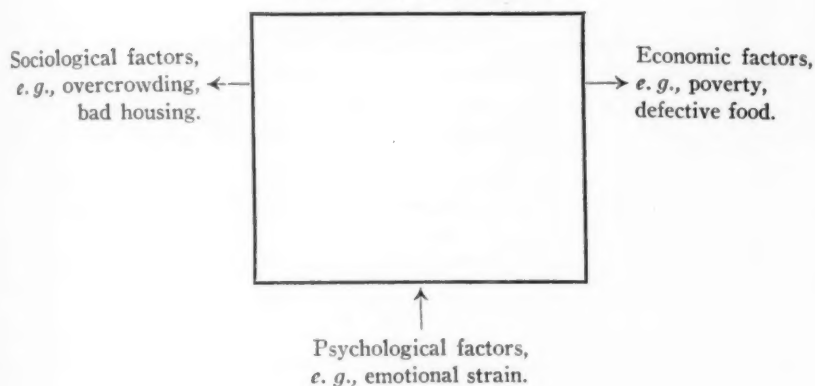
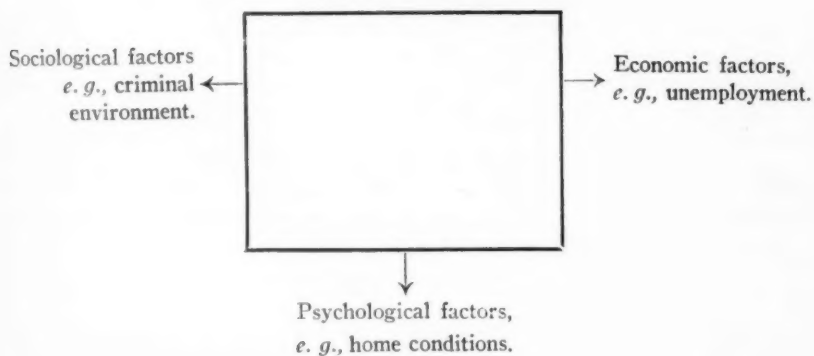


TABLE IX.  
THE GESTALT CONCEPTION OF THE CAUSATION OF CRIME.  
Endocrine imbalance.



These data, then, demonstrate that endocrine disturbances occur at least from two to three times as frequently among the criminal group as they do in a control group. Also, that certain types of crime tend to be associated with certain types of endocrine deficiency and imbalance. Deficiency of the parathyroid and pituitary glands, associated with hyperfunction of the thyroid and thymus, an instability of the adrenal glands and an interference with the proper maturation of the gonads seem to be the outstanding disturbances.

Borrowing a term from embryology, we may say that the anlage out of which crime develops is this endocrine combination, or variations of it. It is the matrix in which it flourishes or the soil in which it grows. Taken in connection with the Gestalt concept of causation, we may understand how, operating in conjunction with economic, social, political or psychological factors the criminal is produced.

As regards the question of modifying, palliating or even completely abolishing criminal behavior by means of endocrine therapy: this is a problem which should be solved by means of properly studied and controlled group statistics. No such group studies were possible at Sing Sing at present under the law. But there are indications from other sources that point to what might be accomplished if such group studies were carried out. These are individual history reports of the results of treatment of children showing anti-social behavior and of adolescents and post-adolescents exhibiting criminal tendencies. In going over the histories of these 250 criminals I have studied, I have been struck by the very great number in whom there is a history of juvenile or adolescent delinquency. In more than two-thirds of those examined, there was such a history of which the following is typical:

CASE I.—The inmate is a well built and muscularly developed white male, aged twenty-eight years.

*Social.*—He was born and reared in New York City under comfortable circumstances by German parents; the youngest of five children. His father was an excessive user of alcohol, but was a good provider. The inmate attended school from the age of six with frequent truancy. His work record was good prior to his release from Sing Sing Prison. Since then investigation shows inquiries into his past record for bonding purposes resulted in frequent job losses. He has worked as a life guard, chauffeur and stationary engineer. He has always had good health. He is an occasional solitary user

of alcohol, but denies drugs and tobacco. He is not a gambler, but has been very promiscuous sexually. He never married.

*Delinquency.*—1913: Truancy, New York Juvenile Asylum, 2 years (11 years of age). 1918: Petit larceny, Kings County Court, suspended sentence (16 years of age). 1919: Criminally receiving stolen property, Elmira Reformatory, 15 month (17 years of age). 1924: Attempted burglary, Sing Sing Prison, 2 years (22 years of age). Present offense: Burglary, third degree; sentenced for 10 years.

Previous to this, he had been arrested and discharged twice for intoxication and once for burglary. Here we have a complete history of a progress in crime from the age of 11 to 28.

*Endocrine Diagnosis.*—Thymus 4 + adrenals 3 —, gonads 2 —.

CASE II.—The inmate is a neat-appearing, well-built and well-nourished man of twenty-one years. He seemed straightforward in manner and cooperated intelligently in the examination. No evidence of a psychosis developed during the interview.

*Social.*—Inmate was born in the City of New York, of New York born parents. He was reared under marginal circumstances by his mother and a maternal aunt. His father, a boss loader, is an excessive user of alcohol and inmate's mother has had to depend upon her ability as a nurse for support. The father and mother have been separated twice. The first separation occurred when inmate was about nine years old. At present, they are living apart. At eleven years of age, inmate was sent to the Children's Village for juvenile delinquency (stolen car). He had previously been discharged on a disorderly child charge. Subsequently, he has served three sentences for petit larceny, attempted grand larceny, second degree, and parole violations. He has been an excessive user of alcohol with an average of two intoxications a week prior to the present offense. He never married and has given no evidence of thrift.

*Report to School.*—Inmate attended school interruptedly to the age of sixteen years and reached the 8-A grade in spite of much truancy and other bad conduct. He has a mental age of 13 and an intelligent quotient of 81; Grade level 7½.

*Endocrine Diagnosis.*—Thyroid 4 +, Thymus 4 +, Parathyroid 4 —.

The social histories of these inmates impresses one with this recurrent sequence of juvenile delinquency, minor crimes of adolescence, and then the major crimes of post-adolescence or maturity.

There is a body of evidence that juvenile delinquents tend to become criminals, and also that a majority of habitual criminals present a history of juvenile delinquency, incorrigibility and anti-social behavior. Healy and Bronner found, in their book on criminals and delinquents (p. 248) that in a study of 420 juvenile delinquents in Chicago, 74 per cent landed in juvenile correctional institutions and of these 50 per cent became adult criminals with

court records and 13 per cent homicides. Also, of 157 adult criminals, 134 or 85 per cent had a history of juvenile delinquency and had been in juvenile correctional institutions. (Healy and Bronner, p. 78.)

Eleanor and Sheldon Glueck (in 500 Criminal Careers), have grouped the 510 inmates of the Massachusetts Reformatory studied by them according to age when delinquency was first committed and age of first arrest.

500 CRIMINAL CAREERS.

	First delinquency.		First arrest.	
	No.	Per cent.	No.	Per cent.
6 or under.....	4	0.8	1	0.2
7 to 8.....	11	2.2	10	2.0
9 to 10.....	36	7.1	34	6.7
11 to 12.....	86	16.9	76	14.8
13 to 14.....	139	27.2	91	17.8
15 to 16.....	117	23.0	85	16.6
17 to 18.....	78	15.3	88	17.3
19 to 20.....	28	5.5	55	10.8
21 and over.....	10	2.0	69	13.7

Age of first delinquency, 66 per cent, or  $\frac{2}{3}$  between age 11 and 16, and 81 per cent, or four out of five between 11 and 18.

Age of first arrest was 48 per cent or about half between 11 and 16 and 66 per cent or about  $\frac{2}{3}$  between the ages of 11 to 18.

There is also a body of evidence that juvenile delinquency and adolescent delinquency are associated with endocrine deficiency and imbalance. In a study made by the present writer of a group of 196 juvenile and adolescent delinquents, as compared with a group of 298 apparently well and healthy children and adolescents of the same age period, signs of endocrine deficiency and imbalance occurred more than twice as frequently, in fact almost three times as frequently in the delinquents. Among the delinquents, the pituitary deficient, 35 per cent, presented a group of incorrigible juvenile offenders, perennial thieves, precocious hoboes and habitual liars. The parathyroid deficient, 30 per cent, were brought for impulsive assault and inability to learn the normal social inhibitions. The thymus-adrenal dysfunctionals, 15 per cent, were the pervers

and exhibitionists. The thyroid disturbed, 20 per cent, were the emotional hysterics with uncontrollable tempers, among those with hyperfunction, while the thyroid deficient were the lazy idlers and gang joiners.

In a recently published report by Rowe of Boston, of a group of 104 children presenting behavior problems classified as asocial, anti-social, morose, bully, disobedient, egocentric, vicious, pathological liars, thief, vagrant, incendiary, sex delinquent or homicide, nearly two-thirds showed signs of endocrine disturbance. In a group of 374 children with a behavior problem, one in five was a pituitary disturbance and one in six a thyroid disturbance. Rowe did not include the parathyroids among the endocrines tested; otherwise he would have found a large group referable to them. Thus evidence is accumulating from a number of different sources that juvenile and adolescent delinquents and behavior problems are the great recruiting ground for the criminal class and that an endocrine disturbance is demonstrable in a great proportion of them. That this associated endocrine disturbance is causative, in a Gestalt sense, is suggested by the effects of endocrine therapy intended to correct the endocrine imbalance. Rowe has stated that there was marked improvement of the behavior of many in the group studied by him when "judicious treatment has palliated the endocrine condition." Rowe does not present the details of his case histories. To illustrate what may be accomplished with proper therapy, I shall give the details of three juvenile behavior problem delinquents I have treated.

CASE I.—This was a boy who had always been a difficult, surly, ill-tempered child. At the age of 9 he was brought into definite conflict with his school authorities because of his continuous lying and cheating. On several occasions he had forged school reports. For two years various methods of handling him were tried, but without success. At the age of 11, an endocrine examination showed definite signs of deficiency of the prepituitary and parathyroid gland. He was treated with hypodermic injections for a year and a half of an extract of the anterior pituitary gland and an extract of the parathyroid glands alternately. At the end of three months there was a marked change for the better in his behavior and at the end of six months his school teachers reported that "he was so changed, that it seemed almost impossible to reconcile his present behavior with his past." This boy has gone through high school without any further conflicts, has entered a college and is doing well both in his studies and in his general social deportment.

**CASE II.**—This was a boy 12½ years old. He has always been extremely impatient of parental authority. Evidenced a violent temper from early childhood. Showed marked precocious hobo tendencies, leaving home for several days and then returning with some incoherent story of what he had done. Abused and assaulted his mother frequently. Is always hard to awaken in the morning. In school was not promoted three times and put back a grade once. Very poor in arithmetic. Yet he was a leader in his group with many friends. He was brought to me because he was caught stealing on one of his periodic excursions. Examination showed a boy with a number of stigmata pointing to failure of the thyroid and pituitary glands. His basal metabolism was minus 19, his radiographs showed a large thymus shadow in the chest, a relatively small pituitary fossa with some degree of absorption of the posterior wall and there was a delay in epiphyseal fusion of certain bones of the hand. The pisiform had not yet appeared, nor the ossification centers in the elbow joint which should have appeared at his age. This boy was given thyroid by mouth and hypodermic injections of post-pituitary and prepituitary extracts. At the end of six months his metabolism had become normal, the pisiform had appeared as well as the ossification centers of the elbow joint. There was at the same time a complete change for the better in his behavior and general attitude. He did better work at school, his nocturnal wanderings ceased, his regular assaultive abuse of his mother no longer occurred. This boy's treatment was continued for one year. He has now gone two years without treatment, and is about to graduate from school, his personality completely transformed, as attested by his teachers.

**CASE III.**—This was a girl of ten who was brought to me because of continuous petty stealing, hypersensitivity and assaultiveness in school and constant truancy. She was 18 pounds under-weight. Endocrine examination showed an enlarged thyroid with a bruit over both lobes. Her basal metabolism was plus 22, and the radiograph of the chest showed a large thymic shadow, while that of the skull showed the pituitary fossa to be enlarged and almost completely enclosed by the clinoid processes with apparent thinning of the floor. Her blood showed high phosphate and high blood sugar percentages, and the electrical excitability of her nerves was ten times the normal average. She was put on Lugol's solution and hypodermic injections of a parathyroid extract. The iodine solution was given intermittently for about six months and the injections continuously for a year. During the period of a year, the child gained twenty-five pounds and grew three inches in height. Her basal metabolism at the end of six months was plus five and at the end of a year was minus five. Her blood chemistry was normalized and so was the electrical excitability of her nerves. Her attendance at school has become regular, she gets along perfectly with her classmates and there has been no more petty stealing from relatives and friends. She has become a different individual, has, in effect, developed character.

These three case histories of definite juvenile delinquents who were rescued and regenerated by endocrine therapy typify what may be accomplished by thorough endocrine examination and care-



ful endocrine treatment. They are but part of this series of 196 juvenile delinquents treated. The results have by no means been as striking in all cases, but lack of improvement could be put down to lack of proper coöperation, insufficiently carried out treatment, or lack of sufficiently powerful extracts. Yet the improvement in the great majority had been so patent as to be remarked upon by the most casual observers. As mentioned, individual case histories of similar results with juvenile delinquents have been published by several physicians. We take it as proven that in certain cases at least, the social Gestalt of juvenile delinquency may be broken up by the treatment of the endocrine disturbance which plays a predominating rôle in it.

It is proper to conclude, then, upon the basis of these findings, that habitual criminals show signs of endocrine deficiency and imbalance almost three times as frequently as the average normal population and that the majority of these criminals are derived from the group of juvenile delinquents who show signs of similar endocrine deficiency and imbalance. Certain of the latter may be corrected by proper endocrine therapy. What further conclusions can we draw and what recommendations can we make?

1. The present methods of dealing with the criminal, confinement in the name of punishment and justice, is completely inadequate, according to Eleanor and Sheldon Glueck, authors of the notable study, "Five Hundred Criminal Careers." Of 500 men who left the Massachusetts Reformatory during 1911-1912 and who received the best possible social and mental treatment, 80 per cent were not reformed five to fifteen years afterwards, but continued committing crimes.

2. The study and treatment of crime should be individualized as is the study and treatment of disease. Every criminal should be examined for the presence of signs of endocrine deficiency and imbalance, including the pituitary, the thyroid, the parathyroids, the thymus, the adrenals and the gonads, as part of the general examination to be added to the psychiatric and social data.

3. The fixed punitive sentence should become a practise of the past. There should be substituted the indeterminate sentence with two types of institutions: one for the first offenders and one for the recidives. In each institution society should attempt to learn from the individual, by the completest possible study, why he com-



mitted the crime and to treat him for any deficiencies found. If deficiencies are found, he should not be discharged until they have been corrected.

4. The greatest hope in the treatment of crime, as in the treatment of disease, when a concept of causation has been formed, lies in prevention. The evidence is strong that the treatment and prevention of juvenile delinquency will result in the prevention of the production of the genuine criminal. If juvenile delinquency is due to endocrine deficiency and imbalance, we should establish great regional endocrine clinics in every portion of the United States to care for delinquent children and also preventive clinics where all children could undergo a periodic survey of the general condition of the endocrine system. The public has been educated to know that the only way to prevent malnutrition and bad teeth in children is to have a periodic survey made of the state of nutrition and the state of the teeth. Twenty years ago this idea was a novelty, but it is an idea to which today the public has become thoroughly accustomed. Similarly, the public must be educated to know that to prevent the appearance of criminal tendencies and criminals, a periodic survey of the state of the functioning of the endocrine glands should be made in every child. The potential criminal is the endocrine disturbed child and adolescent. Early diagnosis and treatment in childhood and adolescence will eliminate the potential criminal. The great hopeful note that must be sounded and should be sounded is the note of prevention in childhood and adolescence before character has set and the inertia of the mature personality has developed.

#### SUMMARY.

1. Crime is due, in a Gestalt sense, to a perversion of the instinctive drives dependent upon a deficiency and imbalance of the endocrine glands.
2. Certain types of crimes are associated with certain types of endocrine malfunctioning.
3. Most criminals are derived from juvenile delinquents and most juvenile delinquents tend to become criminals.
4. Endocrine imbalance and deficiency have been found to occur in about the same frequency and of about the same type in juvenile delinquents as in criminals.

5. Endocrine treatment of the specific endocrine condition in juvenile delinquents has resulted in a correction of the delinquent behavior.

6. Juvenile delinquency and its sequel, crime, can be prevented by proper attention to the status of the different endocrines which contribute to the development of the normal social personality during childhood and adolescence.

7. All our concepts of justice, punishment and crime must be revised and reconstructed in the light of these findings.

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## MENTAL DISORDERS IN SIBLINGS.\*

By DONCASTER GEORGE HUMM.

### I. INTRODUCTION.

This is a study of mental disorders in the siblings of persons who are themselves suffering from certain mental disorders or serious social maladjustments. The problem with which the study is concerned is one of causation. It seeks to make a comparison of groups of subjects representing different degrees of genetic relationship to persons afflicted with so-called constitutional mental disorders.

It appears from a search of psychological and psychiatric literature that no study has been published of the incidence of mental disorders among the siblings of persons suffering from constitutional mental disorders, classified according to the diagnoses of the original subjects.

The importance of such a study is suggested by Ellis<sup>\*</sup> in his statement :

A fundamental test of inheritability is the extent to which traits of different children of the same parents correlate with each other. By appropriate comparisons the effect of environment may be held constant and the effect of heredity determined.

Children of the same parents do not all bear the same genetic relationship to one another. The closest possible relationship is that between monozygotic twins. Since they originate in a single fertilized ovum from which eventually two embryos are formed, the two members of a pair are identical as far as their endowment of genes and chromosomes is concerned.

Dizygotic twins, that is, twins who are produced by the fertilization of two ova by two sperm cells, have less chance of receiving identical endowments of genes and chromosomes and, therefore, are less closely related to each other than are monozygotic twins.

Siblings, that is to say, children of the same parents who are not twins, are generally considered to have the same relationship to one another as have dizygotic twins.

\* Presented at the University of Southern California as a doctor's dissertation.

A study of mental disorders in twins has been undertaken by Rosanoff,<sup>2</sup> who has secured a collection of records of several hundred pairs of twins, one or both of each pair being afflicted with a mental disorder. Of these, 214 pairs represent the mental disorders chosen for this study of siblings.

Rosanoff's comparison of monozygotic twins with dizygotic twins suggested to the writer an additional comparison, that of the twins of persons afflicted with a constitutional mental disorder with the siblings of persons so afflicted. Rosanoff kindly offered the use of his data of twins (as yet unpublished) for this purpose.

Two types of comparison are thus made possible: the first, a comparison of the incidence of mental disorders in three groups having different degrees of genetic relationship to persons afflicted with such disorders, namely, the monozygotic twin brothers or twin sisters of such subjects, siblings of such subjects, and the unselected population; and the second, a comparison between two groups having the same genetic relationship to such subjects, namely, dizygotic twins and siblings.

Attention is called to the fact that the unselected population, while representing the most remote degree of genetic relationship to persons afflicted with these mental disorders, is not entirely without such relationship. On the contrary, it includes subjects strictly comparable to those contained in all the groups considered in this study, and, in addition, presumably a large majority consisting of subjects who are without genetic relationship to persons suffering from these mental disorders.

Although the principal purpose of this study is the investigation of the effect of relationship to afflicted persons, some light has also been shed by our material on the effect of age and sex in the causation of the disorders under consideration and on the relationship of these disorders to one another. These findings will also be reported.

Before proceeding to the presentation and analysis of our data, it is necessary to describe the method used in gathering it.

Five mental disorders were selected for study: 1, mental deficiency; 2, epilepsy; 3, dementia præcox; 4, manic-depressive psychoses; and 5, criminalism.

While heredity has often been mentioned among the causes of these mental disorders, there is by no means a unanimity of opin-



ion on this point. For example, Ellis<sup>9</sup> finds objection to Goddard's<sup>10</sup> conclusion that feeble-mindedness is a Mendelian recessive, and Rosanoff's<sup>11</sup> study of Mendelian heredity received some criticism, especially in England. While Goring<sup>12</sup> says, "The criminal diathesis is inherited at much the same rate as other physical and mental qualities;" Myerson<sup>13</sup> maintains that, "To lump criminality as psychopathic is to forget the teachings of history and to throw overboard common sense."

For the original subjects whose siblings were to be investigated, records of 225 persons affected with the disorders mentioned above were secured. There were 25 males and 25 females affected with each of the disorders with the exception of criminalism, which is represented by 25 males but no females.

It was originally intended to secure also the records of 25 female criminals, but this plan had to be abandoned because of scarcity of material. There are about 150 females in San Quentin Prison and none in Folsom Prison. When selections in keeping with our requirements were made, 37 suitable subjects were found. Field work disclosed only 3 of these as available for final consideration. This situation is not unusual, for prison statistics of all states and of foreign countries indicate quite uniformly that the incidence of criminalism among women is very much less than among men.

The original subjects of this study are referred to as *propositi*. They are not included in any of the statistical analyses that have been made. This is in accordance with a method described by Weinberg,<sup>14</sup> who says:

Sibs of a proband (the subject chosen because he has a given trait) have the same probability as to combination of parental genes as the proband, but are not exposed to one-sided selection. Thus drafting a ratio from sibs, excluding probands, approximates the true genetic ratio.

In the selection of *propositi*, all atypical cases and cases of mixed diagnosis were excluded and typical cases only were taken. Principles of diagnosis in psychiatry as outlined in standard works, such as those of Henderson and Gillespie,<sup>15</sup> Abbot,<sup>16</sup> and Rosanoff<sup>17</sup> were followed. The terminology employed in this study conforms with the official classification adopted by The American Psychiatric Association.<sup>18</sup>

In the selection of *propositi* with mental deficiency, all crippled and malformed subjects were excluded in order to avoid the selec-

tion of individuals whose mental incapacity was due to prenatal disease, birth injury, etc.; all subjects with positive Wassermann reactions or history of such were excluded in order to eliminate cases possibly due to neuro-syphilitic disease; all epileptic subjects were also excluded, and all subjects previously reported as normal, in order to eliminate acquired deteriorations.

The criteria for the selection of *propositi* with mental deficiency were as follows: (1) An intelligence test revealing an intelligence quotient below 70; (2) an uninterrupted history of mental deficiency from birth; and (3) the criterion of the (British) Royal Commission on the Care and Control of the Feeble-Minded," inability to compete on equal terms with normal persons or to manage oneself or one's affairs with ordinary prudence.

In the selection of *propositi* with epilepsy, only such cases were included as showed unmistakable signs of idiopathic epilepsy. All cases of brain disease, such as neuro-syphilis, all cases of head injuries with residuals, and all cases of malformed or misshapen individuals were excluded.

In the selection of *propositi* with dementia *præcox*, no case was included which had not progressed to the point of hallucinations. All cases were excluded which showed an admixture of manic-depressive symptoms. Special care was taken to differentiate between flight of ideas and incoherence. Paranoid cases were included only when deterioration was established. At the same time, all deteriorated cases which were accepted were required to show marked schizophrenic symptoms.

Selection of *propositi* with manic-depressive psychoses was made on the basis of the presence of disorders of attention, emotion, and disturbances of the reactions (pressure of activity or retardation). No cases were included in which there were records of hallucinations or which were predominantly delusional. All cases included had a history of at least one previous attack; and in all cases the previous attacks had invariably terminated in complete recovery.

For the criminal group, *propositi* were selected on the basis of persistent criminalism, as evidenced by (1) a history of delinquent tendencies in childhood, often with commitment to juvenile institutions, and (2) conviction of at least two felonies or serious misdemeanors. In our selection of cases for this group, a special effort was made to secure for it the greatest possible homogeneity; only

those cases were included in which the criminal career had been characterized by crimes against property, with or without violence. Crimes of passion, crimes arising out of sexual psychopathies, drug addiction, etc., were excluded.

Records of *propositi* were secured from state institutions and from other sources, as follows:

San Quentin Prison was the source of all criminal *propositi*, each of whom was interviewed in person. In each case the purpose of this investigation was explained and the permission of the *propositus* secured before his case was included for study. Then a personal history of the *propositus* was taken to supplement the prison records, and the number, social status, and present condition of the siblings ascertained.

Norwalk State Hospital was the source of all *propositi* with manic-depressive psychoses and with dementia *præcox*.

Pacific Colony was the source of most of the *propositi* with mental deficiency and with epilepsy. The White Memorial Clinic, the Psychological Department of the Los Angeles City Schools, the Los Angeles County Farm, and the Los Angeles Diagnostic Clinic for Neuro-Psychiatry and Psychology provided the remaining cases of mental deficiency and epilepsy.

From these institutions the record of each *propositus* was secured, including personal history, history of the mental disorder, institutional history, records of physical and mental examinations, and the diagnosis made by the institution staff. At the same time, any information available concerning the siblings of these patients was secured, and the names and addresses of relatives or other persons from whom additional information concerning the siblings could be obtained.

No *propositus* was selected for study who was not reported to have at least two living siblings. The study was restricted to living subjects in order that its data might be strictly comparable to the data of other studies and of the unselected population. In the course of the field work it was discovered that some siblings had been reported who were in fact half-siblings. These were excluded. In a few families this reduced the count to one sibling besides the *propositus*.

After the *propositi* had been selected, information concerning the siblings was obtained by personal visits to the homes of informed relatives.

A record card, five by eight inches in size, was provided for the collection of data. These data included name, birthplace, date of birth, race, sex, marital status, occupation, diagnosis, institutional history and a summary of the personal history of each sibling, the tests, symptoms and other data upon which diagnoses were based, and the names and addresses of persons and institutions from which data had been or could be obtained.

Every effort was made to win the cooperation of the relatives on first contact. Inasmuch as full cooperation was considered essential to the collection of valid data, it was decided to abandon any case rather than to try to secure information unwillingly given.

A letter of introduction, setting forth the purposes of the study, was secured from each institution supplying *propositi*, and this letter was presented with the assurance that all data would be reported without identification of the subjects and that no obligation to cooperate with the investigator existed. The latter statement was necessary because the official stationery of the institution sometimes gave the impression that the visit was official.

A brief personal history of each sibling was secured, in the course of which symptoms of mental disorder in each individual were sought by specific questions. No reliance was placed on general questions as to which of the siblings were affected by mental disorders or were habitual criminals. Since nearly all of the individuals questioned were unaware of the significance of the symptoms about which inquiry was made, this method served to reveal affected siblings who had not been so reported in the family histories on file in the institutions.

Whenever the personal interview revealed that a sibling had been or was an inmate of a state hospital, a request was sent to that institution for his record, invariably with prompt compliance. Such requests for supplementary information were also directed to schools, prisons, institutions for juvenile delinquents, probation departments, private institutions, and physicians, with very few failures to comply.

In classifying the siblings, it has been found necessary to use certain terms in specific meanings, which are here given.

Those siblings are classified as *normal* who have been consistently able to earn their own livings, conserve their resources, live in harmony with their families and neighbors, avoid trouble with

public authorities, without breakdowns or intervals of disability except for physical reasons.

The word "affected" is used to describe siblings showing symptoms of mental disorders in any degree of severity.

The affected subjects are classified according to the severity of their symptoms into two groups, namely, disabled and handicapped.

Those subjects are classified as *disabled* whose mental disorders are so severe as to prevent normal adjustment to life situations. For criminalism, this means repeated conviction of crime and sentence to penal institutions; for epilepsy, attacks of grand mal seriously interfering with the duties of life; for the psychoses, such disability as to require hospitalization or equivalent care; and for mental deficiency, such disability as to require guardianship or institutionalization. Diagnoses of the latter disorder were confirmed in most instances by the results of standardized intelligence tests.

Those subjects are classified as *handicapped* who present symptoms of the disorders under consideration or of other mental disorders in less than disabling degree, but of sufficient severity to interfere materially with the normal adjustment of the individual.

## II. GENERAL SURVEY OF THE MATERIAL.

In this chapter are presented the data collected concerning the *propositi* and their siblings and, for purposes of comparison, the data of twins selected from Rosanoff's material. Analysis of the data will be undertaken in the chapters which follow.

1. *The Propositi*.—As stated above, there are 225 *propositi*. In Table I these are classified according to diagnosis, sex, and age. All of the criminal *propositi* and all those suffering from manic-depressive psychoses and dementia præcox were secured from state institutions and are designated "institutional." As was mentioned before, some of the *propositi* suffering from epilepsy and mental deficiency were obtained outside of state institutions. These are designated as "extramural," even though they may have received care in other than state institutions.

2. *The Siblings*.—These *propositi* have 859 living siblings. One of the siblings, a four-month-old baby, was eliminated for the reason that it was impossible to determine his mental condition. The distribution of the remaining 858 is given in Tables II A and II B.

These tables present the siblings classified according to the diagnosis of their respective *propositi*, sex of *propositi*, their own sex, and their own diagnosis.

Siblings who are inmates of state institutions are indicated in Table II A by numbers in parentheses. Numbers not in parentheses include both extramural and institutional cases.

TABLE I.  
THE PROPOSITI.  
CLASSIFIED BY DIAGNOSIS, SEX, AND AGE.

Diagnosis		Sex	Age					Total
			0-19	20-29	30-39	40-49	Over 49	
Criminalism.....	Institutional	M	3	16	3	2	1	25
Manic-depressive psychoses	Institutional	M	2	5	2	6	10	25
		F	0	6	9	3	7	25
Dementia præcox.....	Institutional	M	0	9	12	2	2	25
		F	0	3	14	5	3	25
Epilepsy.....	Institutional	M	2	8	3	2	1	16
		F	7	6	3	4	0	20
	Extramural	M	4	2	1	1	1	9
		F	1	1	2	1	0	5
	Institutional	M	13	2	1	3	0	19
		F	14	5	0	0	0	19
Mental deficiency.....	Extramural	M	6	0	0	0	0	6
		F	5	1	0	0	0	6
		M	30	42	22	16	15	125
Totals.....		F	27	22	28	13	10	100
Grand totals.....			57	64	50	29	25	225

In Table II A, all those cases which are not classifiable in the five clinical groups represented by the *propositi* are placed in the column headed "Miscellaneous." These miscellaneous disorders include such cases as psychopathic personality, goiter with mental symptoms, borderline manifestations, migraine, etc. All cases classified as handicapped but not disabled are to be found in this group.

The miscellaneous group is presented in detail in Table II B.

It is thus possible to note the diagnosis of every affected sibling, and to compare the diagnosis of each sibling with that of his *propositus*.



TABLE II A.

## THE SIBLINGS.

CLASSIFIED BY DIAGNOSIS AND SEX OF THEIR RESPECTIVE PROPOSITI AND BY THEIR OWN DIAGNOSIS AND SEX.

Propositi		Diagnosis of siblings							
		Criminal	Manic-depressive psychoses	Dementia præcox	Epilepsy	Mental deficiency	Miscellaneous*	Normal	Total
Diagnosis	Sex								
Male Siblings.									
Criminalism.....	M	8(5)	...	...	...	1	6	48	63
	F	...	...	...	...	...	...	...	...
	Total	8(5)	...	...	...	1	6	48	63
Manic-depressive psychoses.....	M	...	7(5)	1(1)	...	1	3	37	49
	F	1	1	...	1	...	6	34	43
	Total	1	8(5)	1(1)	1	1	9	71	92
Dementia præcox.....	M	...	1(1)	1(1)	...	...	2	37	41
	F	...	1(1)	1(1)	...	1	3	44	50
	Total	...	2(2)	2(2)	...	1	5	81	91
Epilepsy.....	M	...	...	...	1	3	6	41	51
	F	...	...	...	1(1)	1	6	35	43
	Total	...	...	...	2(1)	4	12	76	94
Mental deficiency.....	M	...	...	...	...	5(1)	1	37	43
	F	...	...	1	...	3	1	25	31
	Total	...	...	1	1	8(1)	2	62	74
Totals.....	M	8(5)	8(6)	2(2)	1	10(1)	18	200	247
	F	1	2(1)	2(1)	3(1)	5	16	138	167
	Total	9(5)	10(7)	4(3)	4(1)	15(1)	34	338	414
Female Siblings.									
Criminalism.....	M	1	2	...	...	3	1	54	61
	F	...	...	...	...	...	...	...	...
	Total	1	2	...	...	3	1	54	61
Manic-depressive psychoses.....	M	...	2(2)	...	...	1	3	41	47
	F	...	4	...	1	...	5	31	41
	Total	...	6(2)	...	1	1	8	72	88
Dementia præcox.....	M	...	1(1)	3(3)	...	...	3	36	43
	F	...	1	1(1)	...	...	4	53	59
	Total	...	2(1)	4(4)	...	...	7	89	102
Epilepsy.....	M	...	...	...	...	3	2	33	38
	F	...	...	...	...	...	3	44	47
	Total	...	...	...	...	3	5	77	85
Mental deficiency.....	M	...	...	...	...	4(1)	1	40	45
	F	...	...	...	1	12(3)	...	50	63
	Total	...	...	...	1	16(4)	1	90	108
Totals.....	M	1	5(3)	3(3)	...	11(1)	10	204	234
	F	...	5	1(1)	2	12(3)	12	178	210
	Total	1	10(3)	4(4)	2	23(4)	22	382	444

\* For distribution of miscellaneous group, see Table II B.



TABLE II B.  
DISTRIBUTION OF MISCELLANEOUS DISORDERS.  
Male Siblings.

Propositi			Total
Diagnosis	Sex		
Criminalism . .	M	2 migraine; 1 schizoid personality; 1 cyclothymic personality; 2 behavior problems.	6
Manic-depressive psychoses	M	1 paranoid personality; 1 psychopathic personality (unclassified); 1 migraine.	3
	F	2 inadequate personality; 2 emotional instability; 1 schizoid personality; 1 epileptic absences.	6
Dementia præcox	M	1 mild hysteria; 1 emotional instability.	2
	F	1 schizophrenia; 2 psychopathic personality (unclassified).	3
Epilepsy . . . .	M	2 migraine; 2 epileptic absences; 1 emotional instability; 1 inadequate personality.	6
	F	1 sleepwalking and nocturnal enuresis; 1 night terrors; 1 petit mal; 1 temper tantrums; 1 paranoid personality; 1 emotional instability.	6
Mental deficiency	M	1 borderline mental deficiency	1
	F	1 nocturnal enuresis and severe headaches.	1

Female Siblings.

Criminalism . .	M	1 emotional instability.	1
Manic-depressive psychoses	M	3 emotional instability.	3
	F	1 mild hysteria; 2 emotional instability; 1 paranoid personality; 1 psychopathic personality (unclassified).	5
Dementia præcox	M	1 exophthalmic goiter; 2 emotional instability.	3
	F	1 schizophrenia; 1 emotional instability; 1 exophthalmic goiter; 1 nocturnal enuresis with episodes of rage.	4
Epilepsy . . . .	M	2 migraine.	2
	F	1 nocturnal enuresis; 1 periodic headaches; 1 cyclothymic personality.	3
Mental deficiency	M	1 migraine.	1
	F		0

3. *Stability of the Data.*—The question may be raised whether the amount of material gathered for this study and presented in Table II A is sufficient for the drawing of valid conclusions. To aid in answering this question, the percentage of affected cases (disabled and handicapped) was computed for the siblings of each group of *propositi* at successive stages in the collection of material to find what difference was made by the addition of new data.

The percentages so obtained and the differences between them are presented in Table III.

Differences were calculated by subtracting the percentages at any given stage from those of the next later stage. Thus, after two-fifths of the families had been collected, the percentage of disabled siblings of criminal *propositi* was found to be 13.3; and after three-fifths of the families had been collected, 11.3, a difference of -2.0 per cent.

With five clinical groups, and two degrees of severity of disorder considered, there are ten differences to be calculated between each two stages in the collection of material. There are three such sets of differences, that between two-fifths and three-fifths of the families, between three-fifths and four-fifths of the families, and between four-fifths and the total number. These three sets of ten differences may be arrayed and their central tendencies and measures of dispersion calculated. The results of these calculations are given in Table IV.

Attention is called to the diminishing semi-interquartile range. Between the first two stages it was 2.5 per cent; between the next two, 1.3 per cent; and between the last two, 0.35 per cent.

Attention is also called to the diminishing range of extreme difference. Between the first two stages it is 14.1 per cent; between the next two, 6.3 per cent; and between the last two, 3.7 per cent.

These diminutions mean, practically, that the data are rapidly approaching stability, and that the addition of a number of cases equal to one-fifth of the present amount of material would make a probable difference of approximately 0.05 per cent of affected cases.

This variation is very considerably less than any amount which might materially alter the significance of our findings.

It must be borne in mind, however, that this is true when all of the affected siblings for each clinical group of *propositi* are considered, divided into not more than two groups, disabled and handi-

TABLE III.  
STABILITY OF THE DATA.  
SHOWING PERCENTAGES OF AFFECTED CASES AT SUCCESSIVE STAGES IN THE COLLECTION OF DATA AND CHANGES IN SUCH PERCENTAGES AS THE COLLECTION PROCEEDS.

Diagnosis of Propositi	Two-fifths collected		Three-fifths collected		Four-fifths collected		Total collected	
	Dis-abled	Handi-capped	Dis-abled	Handi-capped	Dis-abled	Handi-capped	Dis-abled	Handi-capped
Criminalism . . . . .	13.3	6.7	11.3	5.9	10.1	7.1	12.0	5.6
	....	....	-2.0	-0.8	-1.2	1.2	1.9	-1.5
Manic-depressive psychoses . . . . .	16.2	16.2	15.4	11.5	12.9	9.5	11.1	9.4
	....	....	-0.8	-4.7	-2.5	-2.0	-1.8	-0.1
Dementia præcox . . . . .	14.9	1.5	10.0	1.8	7.8	5.2	6.7	5.2
	....	....	-4.9	0.3	-2.2	3.4	-1.1	0.0
Epilepsy . . . . .	4.6	2.3	4.9	10.6	4.5	11.0	5.0	9.5
	....	....	0.3	8.3	-0.4	0.4	0.5	-1.5
Mental deficiency . . . . .	23.6	2.8	17.8	1.8	14.9	1.4	14.8	1.6
	....	....	-5.8	-1.0	-2.9	-0.4	-0.1	0.2
Total . . . . .	14.2	5.8	11.6	6.4	9.9	6.9	9.8	6.3
	....	....	-2.6	0.6	-1.7	0.5	-0.1	0.6

capped. More detailed analysis will result in higher probable errors, which will be taken into account when such detailed analysis is presented.

It will be noted that in each of the three sets of calculations made (except the first), all of the material used in previous calculations is used again, with an additional one-fifth included. It is to be expected that the increase in numbers incidental to the inclusion of successive fifths will of itself bring about a lessening of differences between the stages. Since such additional data may be expected to affect that data inversely as the square of the population, we may expect that the addition of the third fifth will affect the results in the proportion of one-half squared or .25; the addition of the fourth fifth, by one-

TABLE IV.

ANALYSIS OF DIFFERENCES IN DATA AT SUCCESSIVE STAGES IN THEIR COLLECTION.

	Obtained differences in percentages		
	By addition of third fifth	By addition of fourth fifth	By addition of last fifth
Means.....	-1.2	-0.7	-0.05
Medians.....	-1.9	-0.8	-0.1
First quartile.....	-4.7	-2.2	-0.5
Third quartile.....	0.3	0.4	0.2
Semi-interquartile range	2.5	1.3	0.35
Extreme difference.....	8.3 to -5.8	3.4 to -2.9	1.9 to -1.8

third squared or .11; and the last fifth, by one-fourth squared or .06. From this we obtain a prospective ratio of .25 : .11 : .06. The obtained ratio of semi-interquartile ranges (2.5 : 1.3 : .35) follows this prospective ratio rather closely, except that the addition of the last fifth results in less than the expected diminution.

4. *The Twins*.—The 214 pairs of twins from Rosanoff's material are represented in Table V.

The twins fall into three classifications, namely: same-sex, probably monozygotic; same-sex, probably dizygotic; and opposite-sex (dizygotic).

Attention is called to the fact that each pair includes a propositus, whose mental disorder led to the selection of the pair for study, and a second twin, who may be either affected or normal. Since

TABLE V.  
THE TWINS.

Diagnosis of propositus	Sex of twin	Same sex Probably monozygotic					Same sex Probably dizygotic					Opposite sex				
		Simil. affected		Disim. affected			Simil. affected		Disim. affected			Simil. affected		Disim. affected		
		Institutional	Extramural	Total	Institutional	Extramural	Total	Institutional	Extramural	Total	Normal	Institutional	Extramural	Total	Institutional	Total
Criminalism.....	M	11	3	14	..	..	..	I	I	I	I	..	..	..	..	..
	F	3	1	4	..	..	..	I	I	I	..	2	..	..	..	12
	Total	14	4	18	..	..	..	2	2	2	6	2	..	..	..	12
Manic-depressive psychoses.....	M	3	1	4	..	..	..	I	..	I	..	..	..	..	..	..
	F	1	1	2	..	..	..	..	..	..	3	..	..	..	..	2
	Total	4	2	6	..	2	2	I	..	I	..	..	..	..	..	8
Dementia praecox.....	M	3	..	3	..	e	I	I	..	I	f	2	..	..	..	8
	F	6	..	6	..	..	..	4	..	4	g	..	..	..	28	8
	Total	9	..	9	..	..	..	5	..	5	2	I	3	..	2	16
Epilepsy.....	M	1	..	1	..	..	..	..	..	..	..	..	..	..	..	3
	F	2	..	2	e	..	I	..	..	..	b	I	..	..	..	3
	Total	3	..	3	I	..	I	..	..	..	..	I	2	..	..	6
Mental deficiency.....	M	12	5	17	..	..	..	5	..	5	d	3	I	4	c	4
	F	9	4	13	c	..	I	7	2	9	3c	..	3	..	..	5
	Total	21	9	30	I	..	I	12	2	14	4	I	5	13	6	9
Totals.....	M	30	9	39	..	1	I	4	8	..	8	2	5	7	3	4
	F	21	6	27	2	4	I	12	2	14	4	I	5	16	I	22
	Total	51	15	66	2	3	5	20	2	22	6	6	12	34	8	34

Code: a, alcoholism; b, behavior problem; c, borderline intelligence; d, emotional instability; e, mental deficiency; f, inadequate personality; g, schizophrenia; h, neurasthenia.

the *propositi* are excluded from all analyses and comparisons, the word "twins" as used hereafter in this study will refer to the second twins only, unless the *propositi* are expressly included.

Each of the three classifications mentioned above is divided into normal and affected. The affected twins are further divided into similarly affected, that is, affected with the same disorder as the respective *propositi*; and dissimilarly affected. The institutionalized and extramural cases are presented separately.

The diagnosis of each dissimilarly affected twin is indicated by a symbol, the meaning of which is given in the code at the end of the table.

It will be noted that the number of twins in some of the clinical groups is small. This results in a high probable error in the percentages of affected cases of those clinical groups. However, the number of twins is sufficiently large to make the percentages derived from the totals significant.

### III. ANALYSIS OF THE DATA WITH RESPECT TO THE AGES OF THE SUBJECTS.

1. *The Ages of the Siblings.*—Some of the mental disorders with which this study is concerned are not likely to appear in subjects who are under certain ages.

It is therefore necessary to classify our material according to the ages of the subjects and also to determine, as far as possible, the average ages of onset of the mental disorders in question.

In Table VI, the siblings, classified by the diagnosis of their respective *propositi* and by sex, are distributed according to age.

2. *Ages of Onset of the Mental Disorders Under Consideration.*—To determine the usual ages of onset of the mental disorders under consideration, several statistical studies were consulted, but were not used because of a statistical error common to all. For example, one writer calculated the mean age of incidence of manic-depressive psychoses as  $37.9 \pm .6$  years, with a standard deviation of  $13.6 \pm .4$  years. Since in a normal distribution approximately 1 per cent of the cases occur below a point minus  $2\frac{1}{2}$  standard deviations from the mean, this calculation is equivalent to the statement that in manic-depressive psychoses we usually find one per cent of the cases occurring below the age of 3 years 9 months, which is con-

trary to fact. The error arises out of the failure to take into account the skewedness of the distributions.

To obtain a more accurate determination of ages of incidence, the Forty-Second Annual Report of the Department of Mental Hygiene of the State of New York \* was consulted and the data there given for first admissions of cases of manic-depressive psychoses and dementia præcox analyzed. It is recognized that age of in-

TABLE VI.  
AGE DISTRIBUTION OF THE SIBLINGS.

Diagnosis of propositi	Ages of siblings						
	0-9	10-19	20-29	30-39	40-49	50 and over	Total
Male Siblings.							
Criminalism.....	3	19	24	13	2	1	62
Manic-depressive psychoses. ....	2	10	13	24	19	24	92
Dementia præcox.....	2	5	30	22	16	16	91
Epilepsy.....	9	17	32	19	11	6	94
Mental deficiency.....	15	18	26	8	6	1	74
Female Siblings.							
Criminalism.....	6	18	20	9	6	3	62
Manic-depressive psychoses. ....	2	7	19	18	19	23	88
Dementia præcox.....	2	7	25	41	15	12	102
Epilepsy.....	7	16	25	20	11	6	85
Mental deficiency.....	25	32	38	8	4	1	108
Totals.....	73	150	262	171	109	93	858

cidence and age of first admission to a public institution do not exactly coincide, but age of first admission is the nearest approximation to age of incidence which is available.

Table VII presents the results of our analysis.

Standard deviations were calculated for the lower half of the curves of distribution to compensate for skew. Only these figures are given because, for the purpose in hand, the upper part of the curve may be ignored.

\* Legislative Document (1931), No. 29.



In order to obtain a group in which the chances approach certainty that all those subjects who ever will have a given disorder have reached the age at which it might have become evident, it is necessary to exclude, in the calculation of bases for ratios, all siblings for whom the chances approach certainty that they are too young to be affected.

Since cutting a curve of distribution at a point  $1\frac{1}{2}$  standard deviation below the mean cuts off about 6.68 per cent of the cases, the chances are approximately one out of fifteen that a random case will be cut off.

The average of points falling  $1\frac{1}{2}$  standard deviations below the mean for the four groups presented above is 20.1 years. However,

TABLE VII.

ANALYSIS OF CURVES OF DISTRIBUTION OF AGES OF FIRST ADMISSIONS TO NEW YORK STATE HOSPITALS.

Obtained data	Manic-depressive cases		Dementia præcox cases	
	Males	Females	Males	Females
No. of first admissions..	359	690	951	990
Type of curve.....	+ skew	+ skew	+ skew	+ skew
Means.....	35.8 $\pm$ .40	35.0 $\pm$ .27	35.0 $\pm$ .21	36.3 $\pm$ .22
Standard deviations....	11.5 $\pm$ .3	10.1 $\pm$ .2	9.0 $\pm$ .1	10.5 $\pm$ .2
(lower half of curve).. - $1\frac{1}{2}$ standard deviations.....	18.5	19.7	21.5	20.6

since we are dealing with approximations, the selection of 19.5 years as an arbitrary point will decrease rather than increase our chances that any sibling will be eliminated who has reached the age of incidence for these disorders.

Since 28 of the siblings are affected with manic-depressive psychoses or dementia præcox in the entire group, and since this represents 3.4 per cent of the total number, the chances for any one of the siblings being so affected are about one out of thirty.

From these two statements of chance we may derive an estimate of the chances of any of our siblings who are below the age of 19.5 years showing symptoms of manic-depressive psychoses or dementia præcox. This chance is approximately one-fifteenth times one-thirtieth, or one out of 450. Since 213 of the siblings are below this

age, in the entire group there are 213 chances out of 450, which indicates that less than half a sibling among those under 19.5 years of age might be affected with one of these mental disorders.

A similar analysis was made of first admissions to Whittier State School, California's institution for young male juvenile delinquents. The curve in this instance was found to approach in outline the lower half of a normal curve with a rounded mode at 15.0 years. The standard deviation of the half curve was  $2.49 \pm .2$ , with the probable error of the mean of .2 (total admissions, 3477). This indicates that the chances that a delinquent boy will be admitted to this institution at an age below 11.3 years are one out of fifteen. Hence, since approximately one seventy-third of the total siblings were found to be criminal, the chances that any who are below the age of 11.5 years would show evidences of criminal tendency at this time are very small (about one-fourth of a sibling in that part of our material).

In connection with epilepsy, age of institutionalization and age of incidence of the disorder have little relationship. For example, Craig Colony, New York, reports \* that the duration of the disease before admission to that institution is ten years or more in 40 per cent of the cases. It is known<sup>7, 38</sup> that in the majority of cases the disease sets in before the age of twenty and that frequently infantile convulsions occur in individuals who afterward develop idiopathic epilepsy. It is, therefore, unnecessary to exclude our younger siblings to make statistical compensation for age of incidence as far as epilepsy is concerned.

It is recognized that mental deficiency is a condition which exists from birth,<sup>36</sup> and therefore, here, too, no compensation for age of incidence is necessary.

In order to compute the ratios of affected cases for the different disorders under consideration, it was necessary to use three bases: (1) the total number of siblings as the basis for finding the ratio affected with epilepsy and mental deficiency, (2) the number over 11.5 years of age for the ratio affected with criminalism, and (3) the number of siblings over 19.5 years of age for the ratio affected with dementia præcox and manic-depressive psychoses. For convenience, these bases were tabulated by groups, and are presented in Table VIII.

\* *Loc. cit.*



These bases will be used in the calculations of all ratios of affected cases.

3. *The Influence of Differences in Age Between Siblings and Propositi.*—Since one of the purposes of this study is a comparison between twins and siblings, it is necessary to ascertain whether the fact that siblings differ in age from their propositi while twins do not is likely to influence our findings.

TABLE IX.

AGE DIFFERENCES EXPRESSED AS ALGEBRAIC SUM OF SIBLING'S AGE MINUS PROPOSITUS' AGE.

Age difference (in years)	Number of siblings		Totals
	Institutional	Extramural	
11 or over.....	..	3	3
10 to 9.....	1	6	7
8 to 7.....	3	8	11
6 to 5.....	3	8	11
4 to 3.....	7	8	15
2 to 1.....	4	8	12
— 1 to 2.....	2	10	12
— 3 to 4.....	5	10	15
— 5 to 6.....	5	7	12
— 7 to 8.....	4	9	13
— 9 to 10.....	2	8	10
— 11 or over.....	1	16	17
Medians.....	-1.5	-1.9	-1.4
Quartile I.....	4.6	4.4	4.2
Quartile III.....	-6.2	-6.2	-6.9
Semi-interquartile range.....	5.4	6.3	5.6

We find such a possibility mentioned in Baur, Fischer and Lenz:<sup>2</sup>

The mere fact that twins are exactly of the same age may partly account for the way in which they resemble one another more closely than do sibs.

This statement brings into question difference in age as a possible etiological factor. If difference in age is such a factor, then one would expect siblings of nearly the same age as the affected propositus to have a higher incidence of mental disorders than those much younger or older.

In order to analyze our data in this respect, we have prepared Table IX.

This table reveals that there is no established tendency for affected cases among the siblings to become more numerous as zero difference in age is approached. The distributions are clearly multimodal. The medians are relatively distant from zero age difference, and the semi-interquartile range is wide, the middle 50 per cent covering a range of over eleven years. Although the number of cases is small (138 affected siblings), it is sufficient to show a definite tendency, if one existed.

It may be safely concluded, therefore, that nearness in age to an affected propositus is not a factor in the etiology of mental disorders in the siblings.

#### IV. COMPARISON OF MONOZYGOTIC TWINS, SIBLINGS AND UNSELECTED POPULATION.

The purpose of this comparison is to determine the ratios of affected subjects to normal subjects in groups bearing different degrees of genetic relationship to affected subjects (the propositi).

TABLE X.

COMPARISON OF MONOZYGOTIC TWINS AND SIBLINGS.

Diagnosis of propositi	Group	Affected		Disabled		Institutional	
		No.	Per cent	No.	Per cent	No.	Per cent
Criminalism.....	Twins....	18	94.8	18	94.8	14	73.7
	Siblings..	22	21.5	15	13.7	4	4.4
Manic-depressive psychoses	Twins....	8	100.0	7	87.5	4	50.0
	Siblings..	37	22.9	17	12.3	7	5.0
Dementia præcox.....	Twins....	10	83.3	10	83.3	9	75.0
	Siblings..	23	12.6	13	7.1	9	5.0
Epilepsy.....	Twins....	4	80.0	4	80.0	4	80.0
	Siblings..	26	15.7	9	5.1	1	0.6
Mental deficiency.....	Twins....	31	97.0	30	93.9	22	68.9
	Siblings..	30	18.9	29	17.3	5	2.8
Totals.....	Twins....	71	93.5	69	90.9	53	69.8
	Siblings..	138	17.8	83	10.8	26	3.5

Table X presents the comparison of monozygotic twins with siblings, classified according to the diagnoses of the respective propositi.

Since the influence of sex is to be discussed in a later chapter, no classification by sex is included in this table.

It will be noted that three comparisons are presented in Table X: (1) ratios determined from the total number of affected subjects, including both handicapped and disabled subjects; (2) ratios determined from the number of disabled subjects only, excluding handicapped subjects; (3) ratios determined from the number of institutionalized subjects only, excluding extramural cases.

This last classification is necessary in order that it may be used in the comparisons of the two groups here considered with the unselected population, for which statistics of institutionalized cases only are available.

Attention is called to the fact that the number of cases included under "institutionalized" is insufficient to fall within the limits found in our study of the stability of the data when subdivided by clinical groups, but is quite sufficient when not so divided.

When the unselected population of the State of California is analyzed, allowance being made for age of incidence of the mental disorders in the same way as was done for the siblings, it is found that 0.565 per cent is institutionalized in state hospitals, homes for the epileptic and mentally deficient, and penal institutions.

Thus we find, comparing our three groups, that the incidence of institutionalization in the monozygotic twins is 69.8 per cent; in the siblings, 3.5 per cent; and in the unselected population, 0.565 per cent.

Since we find that the closer the degree of genetic relationship to affected subjects, the greater is the incidence of mental disorders, we are justified in the conclusion that *genetic factors play an important part in the causation of these disorders.*

#### V. COMPARISON OF OPPOSITE-SEX SIBLINGS WITH OPPOSITE-SEX TWINS.

A comparison of the siblings of persons affected with mental disorders with the dizygotic twins of such subjects is a comparison of two groups having the same degree of genetic relationship to affected subjects.

If such a comparison reveals that the incidence of the disorders under consideration is the same for the two groups, it will strengthen our conclusion that genetic factors are important in the causation of such disorders.

If, on the other hand, it is revealed that there is a considerable difference in the incidence of these disorders in the two groups, it will have to be concluded that some other factor or factors also play a part in their causation.

In the classification of same-sex twins into monozygotic twins and dizygotic twins, some difficulty presents itself. In a given case of same-sex twins, it is often difficult and sometimes quite impossible to determine whether they are monozygotic or dizygotic in their origin. It happens that there is more likelihood of monozygotic twins failing to resemble each other closely than of dizygotic twins

TABLE XI.

COMPARISON OF OPPOSITE-SEX TWINS AND OPPOSITE-SEX SIBLINGS BY  
NUMBER AND PER CENT OF AFFECTED CASES CLASSIFIED BY  
DIAGNOSIS OF PROPOSITI.

Diagnosis of propositi	Twins		Siblings	
	Number	Per cent	Number	Per cent
Criminalism .....	2	14.3	7	14.7
Manic-depressive psychoses .....	0	0.0	15	18.8
Dementia præcox .....	2	11.1	13	14.5
Epilepsy .....	0	0.0	13	17.2
Mental deficiency .....	14	50.0	11	15.5
Total .....	18	24.3	59	17.1

appearing to be identical. Therefore, a group of same-sex twins classified as dizygotic is likely to include some monozygotic twins through error.

For this reason, we have selected for our comparison opposite-sex twins—who are always dizygotic—and siblings of a sex opposite to that of their respective propositi.

From this table it appears that there is a higher total incidence of mental disorders in opposite-sex twins than in siblings. However, when each disorder is considered separately, differences between them are discernible.

Mental deficiency presents the greatest difference between the two groups. *It appears that some prenatal factor or factors other than heredity also enter into the causation of mental deficiency and*



*that such factor or factors operate more frequently in the cases of twins than of siblings.*

It may be noted in connection with manic-depressive psychoses and epilepsy that the numbers of cases of twins (8 and 6 respectively \*) are insufficient to furnish statistical data.

In connection with criminalism and dementia præcox, however, there is enough material in the collection of twins (14 and 18 pairs respectively \*) to permit of a comparison, and in these groups only small differences are to be found between the incidence in opposite-sex twins and that in siblings of a sex opposite to that of their respective propostiti.

Because of the small number of opposite-sex twins available, we are not able to make a quantitative estimate of any difference that may exist between such twins and siblings, for the reason that the probable error of such a small number is too great. At this time we can only say that our comparisons do not certainly show that factors other than heredity play any part in the causation of mental disorders, except in the case of mental deficiency.

#### VI. RELATIONSHIPS BETWEEN THE MENTAL DISORDERS STUDIED.

The frequent occurrence of different mental disorders in the same families has often been mentioned in the literature.

Rosanoff's study of this matter \* led him to the conclusion that the essential cause of constitutional mental disorder is general neuropathic heredity.

It will be of interest to examine our data to ascertain to what extent the disorders under consideration are found together in families.

Table XII compares the diagnosis of each sibling with that of his propositus, and Table XIII presents another arrangement of the same material to show the incidence of the disorders within the families.

In this comparison, the handicapped cases have been classified with the disabled cases of related disorders, but separately enumerated. In Table XIII, two classifications are used. The first, referred to as "affected," includes the cases both of the disorder and of the allied handicapping conditions. The second, referred to as "disabled," includes only the the cases of the disorder.

\* See Table V.

TABLE XII.  
COMPARISON OF DIAGNOSES OF SIBLINGS AND THEIR RESPECTIVE PROPOSITI.

Diagnoses of siblings	Diagnoses of propositi									
	Criminal		Man. dep. psychoses		Dementia praecox		Epilepsy		Mental deficiency	
	M	F	M	F	M	F	M	F	M	F
Sex of siblings										
	Number		Number		Number		Number		Number	
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Criminalism.....	8	1	1	...	...	...	...	...	...	1
	12.9	1.9	1.1	...	...	...	...	...	...	1.2
Manic-depressive psychoses*	2	...	...	...	...	...	...	...	...	...
	3.2	...	...	...	...	...	...	...	...	...
Dementia praecox....	...	2	8	6	2	2	...	...	...	1
	...	5.3	10.1	7.5	2.3	2.1	...	...	...	1.9
Epilepsy*.....	1	...	2	5	1	3	2	1	...	...
	2.5	...	2.5	6.3	1.2	3.3	3.0	1.6	...	...
Mental deficiency....	...	...	1	...	2	4	...	...	1	...
	...	...	1.3	...	2.3	4.3	...	...	2.6	...
	1	...	2	1	1	1	1	...	...	...
	2.5	...	2.5	1.1	1.2	1.1	1.5	...	...	...
	...	...	1	1	...	...	2	...	1	...
	...	...	1.1	1.1	...	...	2.1	...	1.4	0.9
	2	...	2	...	...	1	8	4	1	1
	3.2	...	2.2	...	...	1.3	8.5	4.7	1.4	0.9
	1	3	1	1	1	...	4	3	8	16
	1.6	4.9	1.1	1.1	1.1	...	4.3	3.5	10.8	...
	...	...	...	...	...	...	...	...	1	...
	...	...	...	...	...	...	...	...	1.4	...

\* See page 265, footnote.

It will be noted that in Table XII the occurrence of two disorders in the same family may be listed in either of two places. For instance, a case of criminalism in the propositus and manic-depressive psychosis in a sibling is tabulated in one position, while criminalism in a sibling with manic-depressive psychosis in the propositus is tabulated in another. In Table XIII these have been consolidated, making a triangular instead of rectangular table.

It was reported earlier in the study that the incidence of the affected cases among our siblings is 17.8 per cent and the incidence

TABLE XIII.  
SIMILAR AND DISSIMILAR MENTAL DISORDERS WITHIN FAMILIES.

		Crimin.		Man. dep. psych.*		Dementia præcox		Epilepsy*		Mental defic.	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Crimin.....	Affected	11	18.0	4	8.9	1	2.5	2	3.2	5	7.7
	Disabled	9	14.8	3	6.4	0	0.0	0	0.0	5	7.7
Man. Dep. psych.*	Affected	..	..	21	26.4	12	13.8	7	9.0	3	4.1
	Disabled	..	..	14	17.6	5	5.5	2	2.2	3	4.1
Dementia præcox	Affected	..	..	..	..	8	8.9	2	2.8	2	3.7
	Disabled	..	..	..	..	6	6.6	0	0.0	2	3.7
Epilepsy*.....	Affected	..	..	..	..	..	..	14	15.3	11	12.4
	Disabled	..	..	..	..	..	..	3	2.1	11	12.4
Mental defic....	Affected	..	..	..	..	..	..	..	..	25	26.9
	Disabled	..	..	..	..	..	..	..	..	24	25.5

\* See page 265, footnote.

of institutionalized cases, 3.5 per cent. The former figure is 5.1 times the latter.

In the unselected population, the incidence of institutionalized cases of these disorders was discovered to be .565 per cent.

If it may be assumed that the ratio in our siblings of institutionalized to affected cases also prevails in the unselected population, it may be roughly estimated that the incidence of affected cases in the unselected population is approximately 2.8 per cent.

Since this includes the incidence of the five mental disorders under special consideration, as well as some miscellaneous disorders, it may be assumed that the incidence of each of these disorders in the unselected population is considerably less than 2.8 per cent.

*The coexistence of dissimilar mental disorders within families clearly indicates that there is some genetic kinship between these disorders, and that a sibling of one of our propositi has a much greater chance of being afflicted with even a dissimilar mental disorder than has an individual picked at random from the unselected population.*

A very striking special instance of dissimilar disorders occurring in the same family is that of the familial coexistence of epilepsy and such conditions as migraine, persistent nocturnal enuresis, night terrors, sleepwalking, etc. In Table II are listed eight such cases occurring in families whose propositus has epilepsy. In Table XIII, the difference between the percentage disabled and the percentage affected, 13.2 per cent, in the coexistence of epilepsy with epilepsy,\* is the measure of the coexistence of epilepsy with these allied conditions.

Another instance is to be found in connection with manic-depressive psychoses occurring in the same families with such conditions as marked cyclothymic personality,\* emotional instability, etc. There are 14 instances of manic-depressive psychoses occurring in the same families with other cases of manic-depressive psychosis, and 7 instances of manic-depressive psychoses occurring in the same families with these allied milder conditions.

#### VII. ANALYSIS OF THE DATA WITH RESPECT TO THE SEX OF THE SUBJECTS.

The effect of heredity may be of two kinds, that which appears in both sexes indiscriminately, and that which appears to be limited by or linked with sex.

Enriques<sup>10</sup> attributes sex-linkage or sex-limitation to the differences between males and females found in the sex chromosomes, males having an X- and a Y-chromosome, and females two X-chromosomes. He states that diagnc or sex-linked inheritance

\*Although migraine, persistent nocturnal enuresis, night terrors, sleepwalking, etc., cannot properly be referred to as epilepsy, they have been classified with that condition in Tables XII and XIII as allied handicapping conditions, in order to demonstrate the frequency with which they occur in families in which cases of epilepsy have been found.

For the same reason, cases of marked cyclothymic personality, emotional instability, etc., have been classified with manic-depressive psychoses in the above-mentioned tables.

occurring in humans is carried through an X-chromosome, the trait appearing as dominant in males and recessive in females. If sex-linkage plays a part in the inheritance of a mental disorder, one would expect a greater incidence of that disorder in males over females.

1. *Comparison of Incidence of Mental Disorders in Siblings Classified by Sex.*—In order to compare the incidence of mental disorders in males with that in females, we have prepared Table XIV, in which our siblings are classified by sex, by diagnosis, and

TABLE XIV.

COMPARISON OF INCIDENCE OF MENTAL DISORDERS IN MALE AND FEMALE SIBLINGS.

Diagnosis of Siblings		Disabled		Handicapped		Total affected	
		M	F	M	F	M	F
Criminalism.....	Number	9	2	2	0	11	2
	Per Cent	2.3	0.5	0.5	0.0	2.8	0.5
Manic-depressive psychoses	Number	10	11	6	9	16	20
	Per Cent	3.2	3.4	1.9	2.8	5.1	6.2
Dementia præcox..	Number	4	4	5	2	9	6
	Per Cent	1.3	1.2	1.6	0.6	2.9	1.8
Epilepsy.....	Number	4	2	13	6	17	8
	Per Cent	1.0	0.5	3.1	1.4	4.1	1.9
Mental deficiency..	Number	15	23	1	0	16	23
	Per Cent	3.6	5.2	0.2	0.0	3.8	5.2
Total.....	Number	42	42	27	17	69	59
	Per Cent	11.4	10.8	7.3	4.8	18.7	15.6

by degree of disablement. In making this table, we have reclassified the affected siblings listed in Table II A under the heading "Miscellaneous"; those whose conditions were allied to the principal disorders in question have been classified as handicapped cases under the diagnoses to which they are related, while those who could not be so classified, such as cases of inadequate personality, exophthalmic goiter, etc., have been omitted.

*We find that males are markedly more frequently affected than females by criminalism, and somewhat more frequently affected by epilepsy and dementia præcox. Females are somewhat more frequently affected than males by manic-depressive psychoses and mental deficiency.*

For the total group, males are somewhat more frequently affected than females.

2. *Comparison of Incidence of Mental Disorders in Same-Sex and Opposite-Sex Siblings.* In connection with the consideration of sex as a factor in the causation of mental disorders, it is interesting to ascertain whether there is a higher incidence in siblings of the same sex as their propiiti than in siblings of the opposite sex.

For that reason, Table XV is presented. This table gives separately the incidence in the brothers of male propiiti, in the brothers of female propiiti, in the sisters of female propiiti, and in the sisters of male propiiti.

TABLE XV.

INCIDENCE OF MENTAL DISORDERS IN SAME-SEX AND OPPOSITE-SEX SIBLINGS.

Diagnosis of propiiti	Brothers of males		Brothers of females		Sisters of females		Sisters of males	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Criminalism . . . . .	15	28.9	..	....	..	....	7	14.7
Manic-depressive psychoses . . . . .	12	26.6	9	24.1	10	26.1	6	14.0
Dementia præcox . . . . .	4	10.6	6	12.3	6	11.3	7	16.8
Epilepsy . . . . .	10	20.7	8	21.2	3	7.2	5	13.1
Mental deficiency . . . . .	6	14.0	6	21.5	13	20.6	5	11.1
Total . . . . .	47	20.4	29	19.4	32	18.2	30	14.1

In reading this table, it should be noted that siblings of the same sex as their respective propiiti are presented in the first and third columns, while siblings of sex opposite to that of their propiiti are presented in the second and fourth columns.

In discussing Table XV, we shall confine ourselves to a discussion of the totals only, because the number of cases in each category is less than the amount we found necessary in Chapter II to establish the stability of the data. The analysis by diagnoses of propiiti is presented to show how the totals were derived.

It will be seen that siblings who are of the same sex as their respective propiiti, on the whole, have a higher incidence of mental disorders than do the siblings of the sex opposite to that of their

respective *propositi*. This difference is not sufficient, however, to cause sisters of female *propositi* to show a greater incidence than brothers of female *propositi*.

Our conclusion must be, therefore, that the male siblings of our *propositi* of either sex have a greater tendency to be themselves affected than the female siblings; also, that siblings of the same sex as that of the *propositus* have a greater tendency to be affected than siblings of the opposite sex.

Sex itself is, of course, a genetic factor. The above finding is to be interpreted, accordingly, as additional evidence to the effect that genetic factors play an important part in the causation of mental disorders.

#### VIII. COMPARISONS WITH OTHER STUDIES OF TWINS AND SIBLINGS.

Among the studies of resemblances of twins and of siblings, special mention may be made of Sandiford's<sup>44</sup> report of the investigations of Wingfield,<sup>45</sup> Merriman,<sup>46</sup> and Thorndike,<sup>47</sup> as tending to support the findings of this study. These investigations deal mainly with resemblances in intelligence.

Sandiford's report, expressed in correlations, indicates that, in intelligence, the closer the degree of genetic relationship of the subjects, the closer their similarity is.

In order to compare our study with these others, a table of the reported correlations is here given (Table XVI). The data of the present study and of Rosanoff's material have been reduced to correlations for this purpose.

Correlations have been calculated by the proportion of unlike signs (Otis<sup>48</sup>). This method affords merely an approximation of the true correlation and has a high probable error in the higher ranges, but it is of sufficient accuracy to use in our comparisons. Considerable differences in method exist between the several studies reported, so that minute differences in correlation coefficients are not significant. The important consideration is that these reported studies show the same general findings as are here reported; that is to say, the finding revealed by each study is that the closer the degree of genetic relationship between the subjects, the greater is the tendency to resemblance between them.



Tredgold<sup>40</sup> reports a study of the siblings of mentally deficient patients. He finds that of 634 living siblings, 90 or 14.2 are mentally deficient; 83 or 13.2 per cent are diseased, criminal, pauperized, or otherwise affected; and 451 or 72.6 per cent are normal. Inasmuch as our study does not deal with physical disease, the only comparable finding is that of the percentage affected with mental deficiency.

TABLE XVI.

CORRELATIONS IN INTELLIGENCE AND IN MENTAL DEFICIENCY IN TWINS AND SIBLINGS.

Classification of subjects	Coefficients of correlation			
	Mental deficiency	Intelligence (after Sandiford)		
		Wingfield	Merriman	Thorndike
Same-sex twins:				
Probably monozyg.....	.97	.90	...	...
Probably dizygotic.....	.69	...	...	...
Total.....	.84	.82	.87	...
Opposite-sex twins.....	.45	.59	.50	...
Total dizyg. twins.....	.59	.70	...	...
All twins.....	.79	...	.78	.78
Siblings.....	.28	.50	...	.30

Our study showed that 13.2 per cent of the siblings of mentally deficient *propositi* were themselves mentally deficient. This is in rather close correspondence with Tredgold's ratio of 14.2 per cent.

#### IX. SELECTED CASES.

The cases of several families have been selected for detailed presentation to illustrate high incidence of mental disorders in certain families, and the occurrence of more than one type of mental disorder within families.

##### FAMILY No. 8.—*High incidence of delinquent traits.*

*Propositus*, male, age 34, negro criminal convicted once of forgery and twice of stealing an automobile, now a prison inmate; as a boy was sent to "special school" for truancy and incorrigibility. *Oldest brother*, age 37, reported as normal without delinquent traits. *Second brother*, age 32, committed to Juvenile Hall for running away at 15; sent to "special school" for habitual truancy; frequently absent without leave during an enlistment in

the navy; reported now to have settled down. *Third brother*, age 28, now in county jail for automobile theft; syphilitic; sent to "special school" as a boy for habitual truancy. *Fourth brother*, age 26, had congenital syphilis, now cured; sent to "special school" because of irregularity of attendance; has lately settled down. *Fifth brother*, age 24, criminal, sent in turn to "special school," Whittier State School, and Preston School of Industry; in jail in 1930 for automobile theft; all of his commitments have been for felonies. *Sixth brother*, age 19, sent to "special school," according to the family report for fighting (fighting without weapons is not a cause for commitment to "special school," but no more specific description of his offense could be obtained). *Sister*, age 22, in Juvenile Hall at 15 for habitual truancy, in county jail in 1930 for attempting to kill another woman with a knife.

FAMILY No. 25.—*High incidence of delinquent traits and mental deficiency.*

*Propositus*, male, age 23, sent to Preston School of Industry at 15 for incorrigibility; in county jail at 18 for rape; now in state prison for grand theft. *Oldest brother*, age 24, mentally deficient delinquent; in Juvenile Hall, 1922, for petty theft and again for burglary, in 1923 for petty theft, in 1924 for truancy: sent to Pacific Colony (I. Q. 57) in 1924, still an inmate there. *Second brother*, age 21, I. Q. 86 (dull normal); three times in city jail for petty larceny, tire theft, each time remanded to Juvenile Hall. *Third brother*, age 18, arrested for burglary in 1930, for gambling in 1930; a leader of a juvenile criminal gang; habitual truant; in 1928 stole and dismantled his father's truck; at present a fugitive from justice for failing to report to his probation officer. *Fourth brother*, age 16, no record of intelligence tests in school, but four failures of promotion and teachers' statements of his inability to learn make mental deficiency strongly presumable. *Oldest sister*, age 15, I. Q. 75, sent to development school because of her inability to cope with school work: *Second sister*, age 7, reported as normal and doing average work in school. *Third sister*, age 4, reported as normal.

FAMILY No. 26.—*Family showing coexistence of atypical manic-depressive psychosis with dementia præcox.*

*Propositus*, male, age 44; hallucinates, seeing the spirits of people emanating from their bodies, and hearing voices coming from a great distance; has the delusion that an electric force is permeating his body and shaking it to pieces. *Oldest brother*, age 48; confined to a rest home in 1930 for three months and discharged as recovered; during the past three years has had several manic-depressive episodes, manic type, which have completely incapacitated him; is easily excited, thin almost to emaciation, restless—in incessant motion when interviewed, is unable to stick to the subject under discussion; at times is very depressed; has not completely recovered from his breakdown; denied hearing voices or seeing visions. This case might be considered typically manic-depressive if the subject had made complete recovery from any of the episodes. *Second brother*, age 45, *third brother*, age 34, and *sister*, age 36, all reported as normal.

FAMILY No. 29.—*High incidence of dementia præcox.*

*Propositus*, male, age 31: "a deteriorated case showing total emotional loss with such a low degree of mentality that he was unable to do the simplest mental tests, although he had at one time graduated from the eighth grade in school" (Norwalk State Hospital records). *Oldest sister*, age 37, had been an inmate of state hospitals since 1913 except for a short parole in 1916; "deteriorated to the point of idiocy" (Patton State Hospital records). *Younger sister*, age 34, "reached first year in high school with a good school record, but is now unable to do the simplest tests; uses neologisms; unable to frame connected sentences; hears voices and sees visions" (Norwalk State Hospital records).

FAMILY No. 49.—*Family showing coexistence of cases of mild manic-depressive manifestations and dementia præcox.*

*Propositus*, male, age 32; "refuses food; sullen, sarcastic, and bitter; thinks attendant is following and harassing him; feels a 'grey ray' working on him; hears voices" (Norwalk State Hospital records). *Oldest sister* age 34, highly emotional, talked in a continuous stream which could not be interrupted; was incapacitated for one month by "nervous breakdown" when brother had to be committed; at times is very "blue." *Second sister*, age 28, reported as normal. *Third sister*, age 26, also had a "nervous breakdown" with total incapacitation for two weeks when brother had to be committed; was advised not to go into teaching profession because of her hyperemotionality; subject to fits of depression.

FAMILY No. 112.—*Family showing coexistence of epilepsy with periodic headaches, enuresis, fits of rage, etc.*

*Propositus*, female, age 42; has had grand mal since childhood about two or three times a week. The *third, fifth, sixth, and seventh brothers*, ages respectively 22, 12, 8 and 6, reported as normal, as are the *oldest, fourth, and fifth sisters*, ages respectively 28, 17, and 15. *Oldest brother*, age 36, has had frequent headaches; is an extremely sound sleeper; had nocturnal enuresis until adolescence. *Second brother*, age 23, walks in his sleep; nocturnal enuresis until present time; almost impossible to waken; "has been so ill with headaches he would lose his mind"; has fits of rage; spells of epileptic absence. *Fourth brother*, age 14; stomach cramps as a child; "has a lot of headaches"; has spells of rage; still has nocturnal enuresis. *Second sister*, age 21; stomach cramps as a child; sound sleeper; has frequent incapacitating "one-sided" headaches. *Third sister*, age 18, has fainted frequently; has many incapacitating headaches. This case is in doubt, due to the fact that "blood disease" was mentioned, although syphilis could not be established. Patient suffers from some eye condition, and is pathologically underweight (33 per cent).

FAMILY No. 127.—*Manic-depressive family.*

*Propositus*, male, age 29; "three commitments to Norwalk State Hospital with complete recovery after the first two; no hallucinations or delusions; completely oriented; distractible but intelligible; has complete insight; in-

cessantly active; excitable" (Norwalk State Hospital records). *Oldest brother*, age 38, a successful business man, but obliged to take several vacations a year to "rest his nerves"; these vacations occasionally consist of rest in bed. *Second brother*, age 36, three commitments to institutions with complete recovery after each; "restless; talkative; oriented; has insight; distractible but intelligible; no hallucinations" (Patton State Hospital records). *Sister*, age 31, confined in a private sanitarium for three months; recovered completely; during attack was alternately excited and depressed; had insomnia, "nervous fatigue to an unendurable extent"; was greatly disturbed at times; no hallucinations.

**FAMILY No. 144.**—*Family showing coexistence of dementia præcox and manic-depressive psychosis.*

*Propositus*, male, age 43, two previous commitments to institutions with complete recovery from each attack; "oriented; memory good; denies hallucinations or delusions; scolds and swears; in previous commitment was very sad, in this one is very irritable; rambling but intelligible conversation; talks a great deal; restless" (Norwalk State Hospital records). *Oldest brother*, 35, *second brother*, 24, *oldest sister*, 41, *third sister*, 30, *fourth sister*, 27, *fifth sister*, 20, and *sixth sister*, 12, all reported normal. *Third brother*, 21, uninterrupted psychosis since 1926; "when admitted was disoriented; had delusion that cocaine was being shot into him; does not finish his sentences; uses neologisms; (later, 7/1/1930) indifferent, incoherent, sluggish, deteriorated" (Norwalk State Hospital records). *Second sister*, 31, "had a nervous breakdown at home in which she was very quiet and retarded and fatigued; wasn't particularly sad—just disinterested" (report of wife of *propositus*); case designated "affected, diagnosis not ascertained."

**FAMILY No. 146.**—*Family showing coexistence of epilepsy and manic-depressive psychosis.*

*Propositus*, male, age 61, "had several previous spells with recovery from each; in only one was it necessary to restrain him" (sister's report); talks and moves constantly; says he feels fine; easily moved to anger and easily diverted from it; no hallucinations or delusions" (Norwalk State Hospital records). *Older brother*, 60, and *sister*, reported normal. *Younger brother*, 50, had frequent convulsions up to the age of 7, none until 14, then had one, after that none.

**FAMILY No. 154.**—*Family showing coexistence of juvenile delinquency, epilepsy, and manic-depressive psychosis.*

*Propositus*, female, age 31; "has had previous episodes of manic excitement without hospitalization; on admission was agitated, talked continuously, showed flight of ideas, hyperactive, resistive; no hallucinations or delusions" (Norwalk State Hospital records). *Oldest brother*, 22, *fourth brother*, 13, and *sister*, 20, all reported normal. *Second brother*, 18, "has habitual fainting attacks in which he falls and hurts himself; afterwards sinking into a stupor; is childish and small—seems like a kid; not smart—not as smart as

my ten-year-old girl" (statement of husband of propositus). *Third brother*, 16, "lazy, will not work; bright, but would not finish school; played hookey; out of control of parents; ought to be put in a home; stole five dollars once, and had to make restitution; travels with a bad gang" (statement of husband of propositus).

FAMILY No. 155.—*Family showing coexistence of manic-depressive psychosis with various types of psychopathic personality and other temperamental anomalies.*

*Propositus*, female, age 40, "three commitments with complete recovery; talkative, distractible, hyperactive, says she feels very happy; not hallucinating" (Norwalk State Hospital records). *Oldest brother*, age 34, inadequate personality; has depended on someone else all his life; never has done anything but odd jobs; shiftless. *Second brother*, 31, has run through the property left him by a will; does no regular work; has no occupation; lazy. *Third brother*, 24, gets into frequent fights; quarrelsome and "hard-boiled"; poor record in deportment in school; has no control of his tongue when angry. *Oldest sister*, 46, restless, fidgety, talkative; had two violent quarrels with sister in which she had to be restrained; continually is "getting switched off of what she's doing." *Second sister*, 45, sour and dissatisfied; religioso; has driven her husband out twice; uses violent language when angered; kicks and strikes relatives; "forgetful" (rather—distractible). *Third sister*, 39, left first husband and ran around "wild" for some time; has very blue spells; has run away from present husband twice; tried to commit suicide twice; drinks a great deal and smokes incessantly, but is extremely religious; claims to hear voices and see visions. *Fourth sister*, 26, ran away to get married at 18; left husband; had illegitimate child; ran wild after boys as an adolescent; was out of control of parents. (Information all given by a relative.)

FAMILY No. 196.—*High incidence of mental deficiency.*

*Propositus*, male, age 13, I. Q. 66; "did not progress well in school; behavior problem; soiled himself and masturbated in class-room" (Pacific Colony records). *Oldest brother*, age 16; "I. Q. 68; sent to development school because of inability to function in regular school" (Bellevue Development School records). *Second brother*, age 12, has just finished third grade (at his age should be finishing sixth grade if of normal intelligence). *Oldest sister*, age 21; "I. Q. 61; sent to development school because of inability to function in regular school" (Bellevue Development School records). *Second sister*, age 19; "I. Q. 58; high grade imbecile or low grade moron; unable to function without guardianship; sex problem" (Pacific Colony records). *Third sister*, age 9, finished third grade at 8½ years; recorded as normal.

FAMILY No. 204.—*Family showing coexistence of epilepsy and mental deficiency.*

*Propositus*, female, age 16; "I. Q. 58; grand mal from 18 months to 7 years; after six years' school experience was still in second grade; hard to control" (Pacific Colony records). Mother reports that child was normal

until age of 18 months, and learned to walk and talk at about 12 months. *Older brother*, age 25, has had grand mal since childhood—as often as thrice daily; sometimes hurts himself in his epileptic seizures; occasional enuresis (mother's report). *Younger brother*, age 12; "does not go to school; does not talk; not able to learn; had one spasm at 2½ years" (report of private home for mentally deficient patients). *Oldest sister*, age 14; "I. Q. 48; never made any progress to speak of in school; seems incapable of learning" (Juvenile Hall report). *Second sister*, age 9; "I. Q. 59; very slow in talking; spasms up to seventh year; unable to make school progress" (Pacific Colony records). *Third sister*, age 8; now in low-third grade, receiving passing marks; had one spasm at one year, another at two years; has had none since (mother's report).

FAMILY No. 203.—*Family showing coexistence of mental deficiency, delinquency, and a case manifested by enuresis, sleep disturbances, outbursts of rage, etc.*

*Propositus*, female, age 24; "I. Q. 60; reached fifth grade in school at 17; was in first grade three years; sex problem" (Pacific Colony records). *Oldest brother*, age 27; reached seventh grade at 15 (should have reached that grade at 12½ if he were normal). *Second brother*, age 26; reached eighth grade at 17 (should have reached it at about 13½). *Third brother*, age 16; stomach cramps regularly as a child; enuresis till 14; used to shake and shudder in his sleep, occasionally crying out; given to rages; very nervous; has just finished seventh grade (2½ years retarded) (mother's report). *Oldest sister*, age 29; finished eighth grade at 17 (2½ years retarded) with low marks. *Second sister*, age 22; I. Q. 75; "sex delinquent; committed to Juvenile Hall and to El Retiro; escaped twice; ran away from home, begging rides and food, sleeping in barns, etc.; finished eighth grade at 15 (one-half year retarded)" (Juvenile Hall report). *Third sister*, age 18, reported as normal. *Fourth sister*, age 15; "65 Educational Quotient—I. Q. probably lower; is in sixth grade, special low group for retarded children; doing work on the fourth-grade level; unwholesome interest in boys" (Compton School report). *Fifth sister*, age 13, "Educational Quotient 59—intelligence quotient probably not any higher; in 'Opportunity Room,' characterized by teachers as hopeless; fair quality of second-grade work; sluggish, unresponsive" (Compton School report). *Sixth sister*, age 8; failed in first grade once; now in second grade receiving average marks (Compton School report).

## X. SUMMARY.

This study was undertaken in the hope of gaining a better understanding of the causation of persistent criminalism, manic-depressive psychoses, dementia præcox, epilepsy, and mental deficiency. A particular object was to determine the relative importance of hereditary and environmental factors in that causation.



The material especially gathered for this study consists of 858 siblings of patients suffering from these disorders. Access was also secured, through the kindness of Rosanoff, to 214 pairs of twins, one or both of each pair being affected by one of these disorders. Of these twins, 138 were dizygotic or probably dizygotic, and 76 were classified as probably monozygotic. In addition, data were secured of the number of persons suffering from these disorders to be found in state institutions, and their percentage in the unselected population.

Thus, opportunity was afforded to make the following comparisons:

1. A comparison as to incidence of mental disorders in three groups having different degrees of genetic relationship to affected subjects: (a) monozygotic twins of affected subjects, (b) siblings of such subjects, and (c) the unselected population, which is a group including individuals of every degree of genetic relationship to affected subjects but composed mainly of individuals without such relationship.

2. A comparison as to incidence of mental disorders in opposite-sex twins and siblings of sex opposite to that of their respective *propositi*. This is a comparison of subjects of the same degree of genetic relationship to affected subjects, with sex as a constant factor. Failure of agreement in incidence is postulated as indicating the presence of some causative factor other than heredity.

3. Comparisons between siblings of different ages and between *propositi* and siblings of different ages.

4. Comparison of the occurrence of dissimilar disorders within the families studied, to determine the relationships among such disorders.

5. Comparison of the incidence of mental disorders in the two sexes, and in siblings of the same sex as their respective *propositi* as contrasted with that in siblings of the opposite sex. This comparison brings under consideration another aspect of genetic relationship.

By means of the first comparison we have found that, no matter what data we have used, whether of affected subjects or disabled subjects or institutionalized subjects, the finding is the same: the closer the degree of genetic relationship to an affected subject, the greater is the tendency to mental disorder. In those twins judged



to be monozygotic, the incidence of mental disorders was as high as 93.5 per cent, with 69.8 per cent in state institutions; in siblings the incidence was as high as 17.8 per cent, with 3.5 per cent in state institutions; while in the unselected population 0.565 per cent only were in state institutions. This would seem to justify the conclusion that genetic factors play a prominent part in the causation of the disorders studied.

By means of the second comparison we have found that, of 74 pairs of opposite-sex twins, both were affected in 18 cases. This is a ratio of 24.3 per cent. Of 401 siblings of the sex opposite to that of their respective *propositi*, we found 59 affected, a ratio of 17.1 per cent.

Unfortunately, the number of cases of twins available was not sufficient to permit a statistical study of the individual clinical groups. It seems, however, that the difference in percentages is fully accounted for in the mental deficiency group and does not exist in an amount greater than the probable error of our data in the four remaining groups. Accordingly, the second principal finding revealed by our study is that some prenatal factor or factors other than heredity play a part in the causation of mental deficiency; that such factor or factors are more frequently operative in twin than in single births; and that this factor or factors are apparently not operative in the other mental disorders studied.

By means of the third comparison, we discovered that we were obliged to make allowance for age of incidence in the calculation of our ratios, for the reason that some of our siblings were too young to evidence some of the disorders, even if likely to be affected by them. After having made such allowance, we found that differences in age, great or small, between siblings and *propositi* had no appreciable effect.

By means of the fourth comparison, we found many siblings affected with disorders dissimilar to those of their respective *propositi*. We found several families in which there was coexistence of manic-depressive psychoses and dementia *præcox*; also even a larger number of families in which there was coexistence of epilepsy and mental deficiency.

We found, further, a very frequent familial coexistence of epilepsy with migrainous headaches, enuresis, and outbursts of rage.

In a similar way we found a familial association between manic-depressive psychoses and cases of cycloid personality.

All this bears out the prevailing belief among physicians that some sort of kinship exists between various constitutional mental disorders, which are clinically rather distinct from one another and conventionally regarded as independent entities.

By means of the fifth comparison, we found sex to be a factor in the causation of these disorders. Of the 858 subjects investigated, 414 were males and 444 females. Of these 75 of the males (20.4 per cent—with allowance for age of incidence) and 62 of the females (15.2 per cent) were afflicted with a mental disorder. In other words, incidence is, on the whole, greater in males.

Sex is, of course, to be regarded as a genetic factor; therefore this finding may be interpreted as affording further confirmation of our first finding.

However, the incidence is not always greater for males in the individual clinical groups, for we find a greater incidence of manic-depressive psychoses and of mental deficiency in the female siblings.

In comparing siblings of the same sex as their respective *propositi* with those of the opposite sex, we find that brothers of males are more often affected than brothers of female *propositi*, while sisters of female *propositi* are more often affected than sisters of male *propositi*; in other words, that incidence of mental disorders is higher in siblings of the same sex as affected subjects than in siblings of the opposite sex. This does not disturb our preceding finding that incidence is higher in males, however, since brothers of female *propositi* are more often affected than are sisters of female *propositi*.

In presenting this paper, the writer wishes to acknowledge the assistance of his Committee on Graduate Studies: Dr. George H. Mount, Chairman, Dr. Osman R. Hull, Dr. Milton Metfessel, Dr. Albert S. Raubenheimer, Dr. Aaron J. Rosanoff, and Dr. John W. Todd.

Particular acknowledgment is due to Dr. Rosanoff for permission to use the data of his collection of records of twins with mental disorders (as yet unpublished). I am indebted to my wife, Kathryn A. Humm, for valuable editorial assistance.

Dr. D. Welty Lefever kindly reviewed the statistics of the study.

For their cooperation in making accessible complete case records of *propositi* and case records or other valuable information concerning siblings, the writer is indebted to the following: Dr. C. S. Cronin, Superintendent, Pacific Colony; Dr. W. P. Goddard, Surgeon, San Quentin Prison; Dr. Malcolm F. Hebard, Resident Physician, Los Angeles County Farm; Dr. J. C. Johnstone, Resident Physician, Pacific Colony; Dr. Clara Schmidt, Psychologist, Los Angeles City Schools; Dr. Edwin Wayte, Superintendent, Norwalk State Hospital; Dr. George M. Webster, Superintendent, Patton State Hospital; many other officials of public and private institutions; and, finally, the relatives of subjects of the study and many of the subjects themselves.

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"We must regard as mentally abnormal any individual whose capacity for adaptation is considerably reduced on account of his mental state. When disturbance is so severe that he cannot follow an ordinary occupation, we speak of insanity."

"The difficulty of the proband-sib method arises out of the circumstance that morbid conditions resembling each other may arise from working of distinct genes."

"The mere fact that twins are of exactly the same age may partly account for the way in which they resemble one another more closely than do sibs."
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## FRAGMENTS OF A SCHIZOPHRENIC'S "VIRGIN MARY" DELUSIONS.

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The following report represents an attempt to understand the synthesis of a group of delusions of a schizophrenic who for six years has proclaimed herself the Immaculate Virgin Mary, Mother of God. In addition she has exhibited odd, bizarre and seemingly meaningless behavior.

It is not often we meet patients of this type who will cooperate in a prolonged psychological analysis. Those who are in the habit of examining schizophrenics in a detailed manner are cognizant of the multitude of difficulties that arise in the course of the analyses. The obstacles encountered are too numerous and too familiar to be enumerated here.

Throughout the presentation primary attention will be focussed upon the specific content and formal presentation of the patient's pathological beliefs, instead of possible underlying organic etiological processes. In doing so the writer is aware of the incompleteness of his undertaking; he may be viewing matters from a simple phenomenological angle. However, in view of our limited knowledge of the line of demarcation between primary structural changes of nervous elements and alterations resulting from the strain of exaggerated and perverted mental attitudes, he feels justified in expressing a specific curiosity in symptomatology.

The patient first came under observation in January, 1930, five years after her admission to the Boston State Hospital. She was interviewed six to ten hours a week for eight months. Often when the writer was not actually present she communicated by writing.

L. D., age 30, single, is the third of seven children born of poor and somewhat oppressed parents. Her father was a bartender before the days of prohibition but since the Volstead Act he has done no work. The mother was a devout Catholic and was greatly

instrumental in the production of a strong religious air in the home. Following the mother's death the patient became housekeeper for the family.

The patient in childhood was somewhat superconscientious. "When I spent money for personal pleasures I sometimes wondered if I should do so, if it would not be better to give this money to those who were suffering."

The patient graduated from parochial school and completed four years of college:

While I was growing up I had no particular desire to follow a definite line of work. I was not talented in any special way. I found studying tedious and often spent considerable time on a subject without gaining much knowledge about it. I could not seem to grasp essential points. If I did, I forgot them quickly. Many students were what I would have liked to be, stylish, capable and talented. I was very self-conscious and did not like to be called on to recite. Sometimes my heart would beat very fast if I was called upon.

In social circles the patient was a "wall-flower." She was extremely prudish and most of her social activities took place in groups of religious coloring. She was never engaged and openly deemed herself a "man-hater." But, in spite of this outward appearance, she was often envious of the attention which several of her friends received. She attended occasional dances but was always in the company of a brother or intimate friends of the family. In the patient's words, "I did not know what it meant to have a good time at a dance."

During the last three years preceding her admission to the hospital the patient remained at home as her father's housekeeper. She became more interested in religious topics and spent much time attending church societies. Several months before the onset of her psychosis she became enamoured of a pious young man who manifested little interest in her. Following a futile attempt to see her fancied lover she was admitted to the Boston State Hospital in December, 1924.

While in the hospital the patient has expressed many fantastic delusions and displayed much odd and queer behavior. The following account is taken from a written communication of the patient:

In the spring of 1925 I discovered I was the Blessed Virgin Mary, Mother of God. No person could be more surprised than I was when I realized

I was the Mother of God, a human being of flesh and blood, a young woman in her late twenties, one of a large family, living as thousands of others, attending school and keeping house. No one had ever said what I accepted as truth was prophetic knowledge, taken on faith. No one had ever told me I was of royal blood, that I was very, very wealthy, that I was being searched for all over the world, that a new world was being built, that those with whom I lived were not my parents, brothers and sisters. It is now 1930 and I am pregnant, through the power of the Holy Ghost. I have become transformed (abdomen thought to be enlarging) but not beautiful of face or figure. Many people have visions of me and artists have drawn me, I have reasoned, but I have never posed for anyone.

In another communication she proclaimed her fancied lover to be St. Joseph, the father of her unborn child. Upon many occasions she exhibited crude erotic behavior. She defecated and urinated on the floor and attempted to handle the genitals of other patients. Each time the examiner visited her she presented him with varying bits of feces, urine-smeared paper, wax from her ears, strands of hair and articles spotted with menstrual blood. She wrapped such objects in pieces of paper and requested that they be taken out of the hospital in order that the world might locate her, the leader of the "pure group," and find out who are members of the "royal family" to which she belongs.

In order to understand the development and specific references of the belief that she is the Virgin Mary, Mother of God, we must make a careful analysis of the years immediately preceding the patient's admission to the hospital. As has been stated, she lived in an atmosphere pervaded with an intense religious coloring. In the summer of 1923 she made the acquaintance of a man in whom she became very much interested. She had already begun to wonder what life held in store for her. The marriage of two of her girl chums acted to intensify preoccupations concerning this topic. In a communication, entitled, "My Conception of the Mother of God," the patient wrote: "During my life I had no real love for a man but enjoyed dancing with them, conversing with them and playing cards with them. No man ever told me he loved me. I didn't know what I was to do in the future but I was not worried. Sometimes I felt very lonesome, as though I wanted someone to love me, but I tried to develop a personal love for God and the Blessed Mother, thinking of them as human beings, like myself." She busied herself by read-

ing religious books, many dealing with the life of the Mother of Jesus. She sometimes phantasied herself sitting in the lap of Jesus and actually fondled a statue of the Blessed Virgin which was in her home. She longed for a home and children of her own. She wrote: "Until 1923 I had never met a young man with whom I fell in love. I knew many men but never loved any of them. I did not keep company, did not receive gifts and was never engaged. I didn't know what my future was to be. On July 24, 1923, a young man named Y. came to my house." At first she was not interested in him but "later when I realized he was religious and wanted to be a priest I changed. I felt I could trust him."

The patient began to fancy that Y. was in love with her. He corresponded with her but also with other members of the family. March 26, 1924 (day after the Feast of the Annunciation in the Catholic Church) the patient started for a distant city to be a bridesmaid at the clothing of her sister as a nun. While in her train berth, "lying down, ready to go to sleep, a sudden inspiration came. It was,—marry Y. I did not hear a voice and did not see a vision. It was as though the three words were written on my forehead. I did not know why I was to marry him. I prayed God to give me two signs; to fill the hole in the upper front of my tooth where the gold filling had fallen out and to remove a very sore corn on the joint at the end of the big toe of my right foot. These requests were not granted but I was not discouraged. I continued to pray."

Long after Y. had ceased to write to her the patient made a futile trip to see him. Her family became alarmed and had her committed to a hospital. A short time after her admission she was given a copy of the Office of the Blessed Virgin. "From this and from a dream I had and my physical condition I discovered that I was the Blessed Virgin, Mother of God, and that Y. was St. Joseph and that God had told me to marry him so that he would be my husband and the father of the Infant Jesus. But the Infant would be in my womb through supernatural means, not as in the case of every other instance in the human race."

The dream to which the patient referred was put into writing. The following is a portion of it. Her brother was talking with a friend, "He said the Blessed Virgin is the Mother of a child.

Do you know who the father is?" The friend replied, "No." The brother answered, "Y. (fancied lover of patient) he is going to marry my sister."

From this description it is evident that the patient's belief that she is the Virgin Mary evolved from mental states which were present earlier in less complicated and more easily recognizable expressions. Specific unsatisfied cravings then led to obvious wish-fulfilling delusions but as time passed idealistic components of the personality veiled them in religious clothing and, by doing so, rendered them more tolerable to the total individual. Another quotation from the patient's article, "My Conception of the Mother of God," will convince one that a synthesis of this nature took place in the construction of the patient's special belief:

I did not know why I was to marry Y. but I supposed it was our duty to bring up a holy family. I always liked children and I knew this would be a pleasure for me but I thought of the intimacy required for married life, such as sleeping together, kissing, etc., and although I did not like to think of such intimacy I knew it would be necessary and I started, in imagination, by kissing Y.'s (fancied lover) picture. Gradually the feeling of intimacy became pleasant instead of unpleasant and I wanted to hug and kiss Y. but could not because he did not visit me and I was taken from my home and placed in a private house. While in the ward I discovered I am the Blessed Virgin Mary and became pregnant through the power of the Holy Ghost on the day after Thanksgiving. I knew then why God had selected a husband for me.

In attempting to analyze this and other delusions of the patient's psychosis, it becomes apparent that many of them and much of her unusual behavior are denatured and condensed expressions of conflicts between disturbing crude instinctive and higher idealistic urges. A careful scrutiny of her religious readings showed the merging of these opposing complexes into their particular fantastic and distorted outlets.

The analysis showed that the patient became aware of her interest in her fancied lover when she noticed him reading a copy of the autobiography of St. Thérèse of Lisieux. Later she bought several copies of this book and sent one to him, in order that they might admire the life of St. Thérèse together.

When one examines the autobiography of St. Thérèse a striking similarity is noted between statements of the author and certain aspects of the patient's psychosis. The patient's behavior



with regard to feces, urine and other bodily excrements becomes more understandable when some of her statements are compared with passages taken from this book. In a communication entitled "The Urine Problem" the patient wrote: "I do not know whether or not my urine differs from the urine of other creatures but I am the only exception to the human race regarding freedom from the original sin. I am the Immaculate Virgin Mary, Mother of God. I became pregnant through the power of the Holy Ghost, not through man. I do not know much about sex relations and sexual intercourse. I think it has to do with the urinating of the man on the woman. No man has ever urinated on me." Compare these words with those written by St. Thérèse to Mother Mary of Gonzaga,—"Jesus knew that His Flower (St. Thérèse referred to herself as the Little Flower of Jesus—the Spouse of Jesus, etc.) was too weak to take root without the life giving waters of humiliation and it is to you that she owes that inestimable blessing."

These acts and statements of the patient with regard to secretory and excretory functions of the body when viewed superficially may seem out of harmony with the religious note of the psychosis. A casual notice of the smearing of articles with urine or nasal mucus, may lead one to relegate such indulgences to the domain of isolated and dissociated activities, meaningless dilapidated performances, but further study reveals that they have been instigated and colored by the same opposing forces which are expressed in the patient's delusion pertaining to Mary.

In the course of her religious readings the patient encountered many books treating of odors of sanctity. In St. Thérèse's autobiography we find the words: "It now remains for me to tell you, dear Mother, what I understand by the sweet odors of the Beloved. Since our Lord is in Heaven I can only follow Him by the traces full of light and the fragrance which He has left behind Him." In another place this same author writes: "For Thee my ointment jar I break, the perfume of my life is Thine." Compare these words with the following ones which have been taken from a written communication of the patient: "When God considers me one of his creatures holy He makes it known in certain ways, such as miracles, visions, dreams and odors or sanctity. This is true regarding me. I wrapped packages of

poems, dead bugs, buttons, my hair, and threw them out of the window. Very often I urinated on pieces of cloth or paper, left feces on paper or expectorated on paper. Perhaps various odors came from these packages." In another paragraph she writes: "Regarding odors, if a group (those who are searching for patient) asked as a sign that an odor of roses come from my urine it would not mean that all the members of my family are saints but it would be one means of finding the members."

These illustrations will suffice to indicate the source of the contents expressed in the patient's pathological beliefs. To understand how bits of such seemingly unrelated material have amalgamated into compromising delusions, thereby rendering life more livable for the patient, we must rid our minds of all preconceived critical thoughts which have been moulded by our own experiences and attempt a sympathetic visualization of the mental life which preceded these beliefs. In doing so we must not make the error of too much rationalization but admit the prelogical qualities of the patient's imagination. There appears evidence of the regressive and primitive archaic thinking of the schizophrenic who does what is best described in the words quoted by S. T. Coleridge from Taylor's *Via Pacis*: "He to whom all things are one, who draweth all things to one and seeth all things in one, may enjoy true peace of mind and rest of spirit." Unsatisfied cravings of the personality, translated into whatever terms she desired, have been treated by an exceptionally vivid imagination. While reaching out for satisfaction from the every day world, "longing for someone to love," the patient experienced the marriage of two of her girl friends, stood as a bridesmaid at the ceremony of the clothing of her sister in a convent, and, when at what seemed to be her rope's end, became enamoured of a man who aroused far reaching memories of one who proclaimed herself the Little White Flower, the Spouse of Christ. This course of events activated an imagination which was capable of animating a statue of Mary and of endowing a simple photograph with the properties of a flesh and blood lover. But the final steps needed for the complete assimilation of such heterogeneous experiences were left to the condensing mechanism of a wish fulfilling dream.

Lévy-Bruhl, Frazer, Malinowski and others have emphasized the influence of the dream and so-called prelogical thinking in

the daily life of primitive peoples. The relationship of this same order of experiences to the inner experiences of schizophrenics has been described by Storch. He has pointed out that the ideas of schizophrenics are, for the most part, connected with sense impressions which are emotionally effective. These individuals permit the perception of differences and resemblances to recede into the background; a single emphasized feature possessed in common by objects is sufficient support for linking the most heterogeneous phenomena. Thus Storch cites an example of a schizophrenic casting anxious glances at a moving door and saying, "The animals are eating me" ("Da fressen mich die Thüren; animal=Thier; Thier is similar in sound to Thür, meaning door"). This same mechanism of identification occurs not only among primitive peoples and schizophrenics but is noted in normal individuals of various walks of life. Nowhere is it better illustrated than in the realm of poetry which, from this point of view, has been so convincingly analyzed by J. L. Lowes, in his *Road to Xanadu*.

In the case of our patient, the anxious affective attitude maintained toward Eros and environmental situations has caused the connotations which go with the Virgin Mary to blend with those accompanying the word Virgin viewed in an entirely different light. The emotionally effective complexes, unsatisfied yearnings for a spouse, for erotic indulgence and the wish for a child have been buried beneath the surface of consciousness in the midst of a multitude of heterogeneous impressions. Mechanisms, so toned, have poured the "life giving waters of humiliation" into a vessel of singularly significant urinary waters and diffused odors of sanctity among aromas originating from more familiar sources. At the same time a number of dissimilar features have been forced into the background; dominating emotional factors have rendered negligible many components which would ordinarily eliminate the possibility of linking these remote experiences. Emotional qualities of this nature are clearly illustrated in another statement made by the patient.

She stated that "music comes from my body." After some time it was discovered that another patient in the ward had been operating a small music box which played two aged melodies, namely, "Sitting in a corner—that is all I do" and "Last night

I loved her on the back porch." It is obvious that the implications of the former song are somewhat in keeping with our patient's social life and the latter tends to add fire to an already highly toned emotional situation. As has been stated, the patient entertained many special ideas with regard to her physique and body odors. On the wards she has been greatly concerned about vaginal odors, particularly after she masturbated. Often she talked of perfumed odors, coming from other patients but none, other than strange odors, came from her because no one brought her perfume. Thus, we see the "I" of "Sitting in the corner—that's all I do" and the "I" of "Last night I loved her on the back porch" identified with the "I" used in the patient's reference to herself. Through the common feature of something *coming from*, melodies of a special significance emanating from a music box and odors from the body of the patient, there has been a linking of extremely remote phenomena—odors, music and body.

Thus we come to a clearer understanding of the manner in which the patient has utilized accepted religious experiences to render tolerable certain instinctive urges. If one chooses to do so he may formulate these emotional cravings in more specific terms but formulations of such a nature are beyond the scope of the presentation. The writer has attempted to deal with only the formal aspect of the patient's fantastic beliefs and odd behavior; to trace some of the experiences which have lent color to the delusional formations which she expressed. The reference of the patient regarding an odor of roses emanating from her urine has a distinct relation to the life of St. Thérèse who chose the rose for her favorite flower.\*

\*The writer wishes to thank Dr. James V. May and his staff of the Boston State Hospital for making it possible to work with this patient over such a prolonged period.

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## BODY INTEREST IN CHILDREN AND HYPOCHONDRIASIS.\*

By DAVID M. LEVY, M. D.,

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This investigation is an elaboration of a previous study † of the responses of children to questions about their bodies, asked immediately following a physical examination. When the physical examination was finished, the child was told that now he was the doctor. What did he know about his hair? Was it all right? Did he like it? What did he know about his ears? His eyes? His nose? His mouth? His teeth? The shape of his skull, and so on, down to his toes, including the sex parts and their functions and the process of growing up. After responses to body parts were elicited, he was asked questions about his height, weight, strength and appearance. "There are 30 boys in your class in school? Well, that makes 3 tens,—a top ten, a middle ten and a low ten. Where would you put yourself for strength; in the high ten, the middle or the low ten? Are you the very tallest, the very strongest, or the very weakest?" When replies were given to questions about body parts, and body attributes listed, the child was asked, "If you could change your body in any way, what parts would you change?"

The part of the investigation that concerns our present study has to do with response to body parts. The psychiatric-physical examination, as it was then named, has been applied since to several hundred children. As the results are generally confirmatory of the original findings, it is sufficient to summarize those for the original group of 20.

Of special interest was the finding that 18 of the 20 children who responded yielded 80 responses showing special interest or sensitivity to their bodies. They were divided into two groups,—those showing six or more responses, and those showing less

\* Read at the eighty-seventh annual meeting of The American Psychiatric Association, Toronto, Canada, June 1-6, 1931.

† A method of integrating physical and psychiatric examination. *Am. J. Psychiatry* 9: 121. July, 1929.

than six. The former were regarded as having "excessive body interest," and compared with the rest in every phase of the social-psychiatric examination.

Before differentiating the children that showed excessive body interest from the rest, it will be necessary to point out some interesting findings for the group and for individual cases.

Boys showed, as compared with girls, special sensitivity to weakness, shortness, thinness and small penis. Girls, as compared with boys, showed sensitivity to facial appearance, hair, tallness, and obesity. In general, the sex differences had to do with measures of physical prowess in boys, with physical attractiveness in girls.

Interesting in the pre-adolescent was the finding that boys showed more sensitivity to breasts and genitals than girls. This was attributed to the fact that boys are exposed to each other's nakedness much more than girls; so that inverted nipples, short nipples, long nipples, fat breasts, etc., attract attention. No doubt a study of post-adolescent girls would reveal greater sensitivity to breast form in that sex.

In general, the most frequent responses were to the visible mouth area,—lips and teeth. Next to these were the eyes and hair. From the social point of view, it appears natural that the most exposed part of the anatomy will be most subjected to observation and comparison. Special points of interest were seen in certain generalizations made from one part of the body for all the others. In the case of a self-derogatory child, everything was too short,—his fingers were too short, his ears were too short, etc. In one case, everything was too long; in another, everything too fat. Objectivations of special points of sensitivity were found also. One boy who had very large ears was especially interested in ears and knew the shape of the ears of every one of his friends; another was especially interested in breasts; another in hair. Certain cases showed sensitivity to all female parts, with a very frank rejection of any bulging part of the body.

Among the boys special interest in the genitals was related, in one case, to actual trauma to the organ, in others to masturbation threats; in the girls, to special training in prudery and to the frequent warning of the mothers that boys especially like to touch girls in those parts.



A number of points of sensitivity are determined directly by general group values. That explains the special regard to physical prowess in boys; and æsthetic attributes in girls. Sensitivity to knees, a finding in some of our girls, would probably not have existed at all or at any rate in so marked degree when dresses were long. Discrepancies of the individual's body from the group norm are so frequent that points of sensitivity of this sort must be found in almost everyone. They were found in all but two of the children in our first group. Of the other two, one did not cooperate, and the other had only good things to say about his body, expressing his admiration for each part in detail. The individual's response to discrepancies between his own anatomy and his concept of the group norm is also reinforced by the fact that the group (especially of children), picks out the individual's discrepancies for him and makes them targets of criticism, approval and disapproval. When the group gives special reassurance or approbation it adds to the individual's self-assurance; when it ridicules, self-esteem is lowered.

Differences related to sexual characteristics brought up, in some cases, doubts as to sex rôle. One boy who had an abscess of the breast which made it appear quite large, said he thought the other one might become large also, that he would look like a girl and then he would have "nothing down below." Likewise, in the case of a boy with large nipples, and another with gynecomastia.

Discrepancies in body configuration pointed out especially by the parents or siblings seemed to have much more significance to the child than differences evaluated largely by the group. These were brought out in response especially to sibling rivalry; for example, in the case of a girl whose crooked teeth were contrasted with her sister's very pretty teeth. Derogatory attitudes on the part of a parent, especially in cases of maternal rejection, brought out very strong responses; for example, in the case of a girl whose mother always pointed out her obesity with disgust. The mother was quite hostile to the child and made that particular body configuration a mark of her disapproval.

Family attitudes toward physical appearance appeared significant when expressed as approval or disapproval. It appeared significant also when not expressed at all. The lack of reassurance about appearance in the few cases studied indicated to the child that the atti-

tude must be a derogatory one. In such cases, the parents refused to praise as a matter of principle, believing that praise would make the children vain. On the other hand, the boy of seven who expatiated at length on all his good points,—the color of his eyes, how his hair looks when combed this way and that way, etc., was the idol of an adoring mother and aunt who made all kinds of clothes for him and placed him in front of them constantly for their admiration. In such cases we infer the lowering or raising of self-regard, hence of body or narcissistic libido. (Note the marked narcissism especially in a girl of rare beauty, or in a boy of rare physique who is constantly the object of praise.)

Scars require special consideration. The reaction of a boy to a scar is often to give an interested account of how the injury was received, with boasting of physical prowess. Along with this boasting there is often a fear of the potential greater injury and a sensitivity to appearance. However, the pride of attaining a scar may even hold when the facial area is involved. (Note social evaluation of scars on the faces of those who duel.) One boy who had a large scar on the cheek said, "If it was lower I would have been killed." He also tried every day to push it down, hoping that in that way the scar could be moved below the jaw where it could not be seen. The tremendous interest in a scar of this type, we may infer, has a special significance if the life of the child was actually threatened.

I have previously pointed out the especially strong reaction to scars resulting from mastoid operations. The scar is a sign that the child was near death. He has no doubt been told by the mother how near he was to death, how they already despaired of his life, how nevertheless he was saved. The manner in which children point to scars of the skull, to which some of them give special significance, indicates the excessive value placed upon them by the mothers, as marks of conditions which had threatened life, or as terrible deformities. The child also soon learns that an injury to the skull is of tremendous significance. The utilization of this injury as a point of interest and of phantasying concerning body functions will be brought out in a case to be cited later.

So far, we have pointed out some of the interesting findings in regard to sensitivity about body parts. There remains for consideration the group of children with excessive body interest. In con-

trast with the rest, the children showing such excessive concern were featured by two findings, namely, the maternal oversolicitude with much concern over the health of the child, and actual experience of illness, whether of exposure to illness of others or one's own illnesses. Maternal overprotection is re-enforced by illnesses of the child, especially by any alarming sickness that makes the child appear as though dead, by operative procedure and by mild but repeated illnesses requiring much care. The strongest incentive to the development of excessive body interest is found in the child who is the victim of a mother-child monopoly.

Up to this point we have utilized the findings of a previous investigation. It will now be interesting to study illustrative cases, trying to evaluate all data that pertain to excessive body interest and to relate these findings to our problem of hypochondriasis.

I have selected the first case to illustrate what I think is a normal response to a marked deformity, showing the immediate withdrawal phenomena, absorption of self that follows, with gradual return to reality. The case is that of a boy who was apparently very well adjusted at home and at school until he sustained an injury resulting in the loss of an eye.

CASE I.—Boy, age 13 years, 0 months; elder of two (no. 2, male, age 12). Referred because of avoidance of companions, increased sensitivity and crying following accidental injury to eye at the age of 11 years, 3 months. The eye was removed and artificial eye placed in shortly after accident. Otherwise no problem. Good adaptation and progress in school and home.

*Data pertinent to blindness in one eye and appearance:*

1. Says he is "different" now and refuses to play with others boys.
2. Family moved to present neighborhood soon after accident because "they" (i. e., mother) wished to leave neighborhood where patient had eye injury.
3. Previous to accident also rather quiet and shy; more so since.
4. Since accident wants to "read all the time," and when mother tries to stop him from doing it excessively, he cries and fusses.
5. Since accident mother has been crying a great deal and has fainted several times.
6. Since (?) accident patient sleeps with knees drawn up and wrists under chin.
7. Since accident brother is jealous of attention shown patient, saying everything is for his brother, nothing for him.
8. After operation and anticipated artificial eye insertion, patient was sent by a social agency to a convalescent camp for 4 weeks. Since returning (2 months ago) has food fads, sleeplessness, and withdrawing tendencies have increased.

9. Since accident has been prevented by mother from playing ball, coasting on sled, riding bicycle, joining boy scouts.

10. Since accident stopped of his own accord piano lessons, boxing lessons.

11. Interest in reading developed after accident (reads 1-2 volumes per week).

12. Refused to go to school, because of sensitivity about eye, knowing he was to have a physical examination (2 years, 6 months after accident).

13. Patient says he notices that children do not look queerly at him, and therefore do not recognize that eye is artificial and do not make fun of him.

In this case the difficulty was due largely to maternal solicitude and was easily remedied. There was no evidence of excessive body interest except in response to the actual eye condition, resulting in difficulty in a natural and gradual adaptation to life following the defect.

Note in the process of adjustment to the eye injury in this case the quick withdrawal from social contacts (refusal to play with other boys, shyness, stopping of piano lessons and boxing lessons, increased interest in reading, refusal to go to school, even the idea that children looked "queerly" at him; also the consequent increased phantasying resulting from absorption in reading); symptoms of infantile dependence on the mother attested by food fads and sleeplessness; and also the actual change in the mother,—her prevention of his indulging in play, such as bicycle riding, that might cause injury, her frequent crying, her fainting spells, her moving to another neighborhood; also that the boy was very well adapted before the injury, and made a very quick and good recovery.

Suppose, however, that he had not been able to make the adjustment, with good progress in school, at home and with companions. In that case the injury to the eye would have increased withdrawal and rejecting tendencies previously displayed. The eye injury would then have been exploited and with that probably other forms of body interest. Such exaggerated interest in deformity would then be secondary to various regressive phenomena of which they are so common a part.

CASE 2.—Female, age 15 years; youngest of 3, and 11 years younger than next sibling. She lived in almost exclusive relationship with her mother who had several attacks of melancholia, committing suicide when patient was aged 12. At 13, lived with stepmother and two step-siblings, later with an older sister.

This child is doing poor work in grade VIII in spite of superior intelligence. She is talented in singing and makes unusually high scores in tests of musical ability. Medium weight and height; negative physical findings.

She was referred because of extreme selfishness, laziness, irresponsibility, trouble-making, sexual boldness and truancy. Spoiled by parents and siblings since infancy, she still constantly demands attention, is unduly concerned about her rights, often remains in bed one to several days at a time without evidence of illness. She may read as long as five hours at a time, disregarding meanwhile all household or school responsibilities. Never offers to help in household even during sickness of sister; on the other hand, expects everyone to wait on her. She is very moody, passing from very restless activity to periods of quietness as in reading or "thinking," isolating herself on the roof for hours at a time. Socially, very aggressive with boys, flirts boldly although allowing no physical intimacy; "wild crushes" on girls. Active sexual phantasying and masturbation.

Patient makes numerous physical complaints: rumbling noises in head, headaches, dizziness, etc.; stays away from school frequently because of illness, presumably imaginary or feigned. The history of her life is largely a record of illnesses or accidents. To the Rorschach test she gives 8 anatomic responses (usual number is 0 to 2).

Anatomical responses to Rorschach test: 1. Part of body around the ribs; 2. Part of intestine; 3. Wooden leg; 4. Framework of body; 5. Lungs; 6. Stomach; 7. Back where the lungs are; 8. Vertebrae. Total Rorschach replies, 43. Other related replies are: 1. Head-rest of a dentist's chair; 2. Some kind of forceps; 3. Grave-yard; 4. Somebody in iron shoes.

*Data referable to development of excessive body interest:*

1. Maternal grandfather, who lived in first home of patient, had manic-depressive psychosis, depressive phases, with numerous suicidal attempts. Attack every 2 to 3 years; longest attack, duration 2 years. Patient referred to several of these depressions.

2. Exposure to melancholia of mother; witnessed several of mother's suicidal attempts, was alone with mother during most of her later depressions, and was present at her suicide (oxalic acid). Besides, mother had habitually complained of physical ailments.

3. Exposure to father's complaints and illnesses. He has always complained of stomach trouble. When patient was aged 13, he had a stroke. Father was a very uncooperative patient and was discharged from hospitals twice for that reason.

4. When patient was aged 6, her brother died of cancer of the knee (at age 20). Patient recounts the history of brother's leg amputation, and her strong emotional response to feeling the stump while sitting next to brother at home and on auto rides. His illness was of six to seven months' duration. Brother and patient were especially fond of each other. After his death she became afraid of the dark and imagined, on closing her eyes, numerous skinny and mutilated people. After his death also, she would "sit on the steps of the front porch and brood."

5. When 2 years old, patient broke her left ankle and was in a cast all summer. She was taken by her mother on weekly visits to the hospital.

6. At age 4, patient fractured her right femur and was sent to a hospital for three weeks; after discharge, remained in bed at home several weeks. In the hospital she was put in a ward next to a boy who died during her stay. Once a nurse jokingly invited her to a party while her leg was suspended, and when patient asked how she could come in her condition, the nurse replied that she would get the doctor to cut her leg off and then she could go. She gives (at 14) a graphic description of her visit to the X-ray room of that hospital.

7. At age 10, patient had several vaginal examinations performed by the family doctor (for vaginal discharge?). The mother, on doctor's advice, frequently applied lotion to patient's vagina.

8. Besides usual childhood diseases (measles at 9 months, whooping cough at 1 year, tonsillectomy at 3 years, mumps at 6 years), she was taken to a physician frequently because of suspected deafness (attributed later to indifference when spoken to); and for a year, between age 8 and 9, for poor appetite and frequent vomiting spells (attributed by physicians to "nervousness" or eye strain). Visits to physician also because of mild myopia (wears glasses).

The factors enumerated all have to do with exposure to accidents, sickness, death, deformity and complaints about illness in others, and to her own experience of illness, hospital internment and the like. In the entire list we would assume that the mother's condition would occupy first place as an influence in developing excessive body interest because of the strong mother-child attachment and the constancy of association. The brother's illness, because of the striking "traumatic" influence of the amputation and his emotional attachment to the patient would also rank high.

Exposure to a long series of illnesses and deaths in the family may occur also in cases in which hypochondriacal symptoms do not develop. As contrasted with the usual history, we may say that in the case of our patient the incidents are unusually frightening and prolonged. Even so, we would have to explain why the patient's response to them is so strong. The answer may be found in (1) an unusually strong emotional bond with the persons affected by the experience; (2) an unusual sensitivity or reaction to her own body sensations or to any functional disturbance; (3) exploitation of illness (so readily found in the environment of our patient) as a method of solving other difficulties.

The strong emotional relationship to the mother has already been referred to. Many abortions were induced by the mother before the birth of the patient because of the old fear of inheritance of insanity. (There are numerous instances of manic-depressive psychosis in the family history. The mother's sister died a suicide.) After the patient came (eleven years after the preceding child) the mother became wrapped up in her, would not allow her to make friends outside the family, indulged her considerably, especially in regard to eating, bringing food to her when she refused to come to the table, inviting children to the table in order to stimulate her child's appetite. The father, a submissive individual, held in frank derogatory relations by the mother, interfered only to prevent punishment.



The strong attachment to the brother is indicated by her emotional response after his death and her glowing affectionate reminiscences.

The evidence is strong, therefore, that the patient's response to the experiences of the mother and brother was strengthened by the strong emotional bond which means, with respect to our problem, that their experiences of disease or death strongly affected, by identification, the patient's own attitudes.

Increased response was favored also by the patient's own illnesses and accidents; increased response through excessive sensation on basis of over-development of erotogenic zone. As a child she was compelled by mother to sit on a stool a half hour for bowel movement. She remains constipated today. A toilet reader since she began to read; she remembers that when mother had her on toilet she tried not to do it. (Sister says mother was "hipped" on subject of going to toilet, that she had the idea that every child must have a bowel movement before breakfast. It was a topic greatly stressed). Patient is constantly smuggling books into bathroom. Response to genitalia and hostility to physician because of vaginal examination. "What's mine is mine" and no one dare touch it. Hostility to male sex, yet strong sexual aggression: her body inviolate, increased narcissism, increased body sensation.

Increased response may be explained on basis of over-emotional reaction due to early lack of modification (emotional indulgences) or inherited or constitutional factors. Evidence of over-response in all emotional situations, noted since early childhood. Vasomotor symptoms may also be an expression of this reaction.

Evidence so far points to selective tendency to increased response to body processes through milieu, familial relationships and individual susceptibility.

Secondary gains remain. Staying in bed and prolonged reading and avoiding responsibility and increased absorption in own sensations and phantasy. Refusal to aid others—but love objects are all gone (mother, brother, father). Illness thus becomes a means to childlike omnipotence and irresponsibility and narcissistic pleasure-gains.

This case is a compendium of the factors that appear in all our cases of excessive body interest:

Exposure to a long series of illnesses in others;

Frequent contact with physicians, clinics and hospitals;

Strong identification with the objects of illness.

It gives us one group of origins—a framework for the development of hypochondriasis,—namely, a sick social milieu and strong identification with the love objects in this milieu. Ordinarily children's response to illnesses of other members of the family is quite superficial. In this case, the maternal overprotection, strong brother-attachment and experience of her own illnesses bind the framework.



A second series of events may increase the significance of the illness factors by their threat to the life of the individual; *i. e.*, by their traumatic values, real or imaginary, or both. Our patient's first experience of the life about her is of illness (maternal grandfather); then follow a number of similar mutilating episodes. At two she fractures her ankle; at four, her thigh, and at that time hears the nurse's laughing threat to have her leg cut off. This threat is turned into an actuality in the case of her brother when she is six. He has an amputation of the leg because of cancer, and she frequently feels his stump at her thigh. After this event she develops fear of the dark and phantasies of skinny, mutilated people (cachected mutilated brother). Actual death scenes follow in her experience of the mother's suicide by drinking oxalic acid when she is 12; and in witnessing the father's stroke when she is 13.

Castration and death summarize the second series of factors.

The brother's mutilation and death are well revealed in the Rorschach responses: wooden leg; iron shoes; graveyard. Her strong hostility to medical examination is partly derived from the castrating fear. Her associations show frank rejection of the female form, glorification of the male body and its appendage; strong sexual aggression with males as though they were easily manipulated females, on the one hand, marked homosexual activity on the other.

The castration-fears reenforce the traumatic value of the fractures and amputation, raise their life-threatening values to a life-threatening experience, and help to fixate the actual experience of the death of the mother.

A third set of factors has to do with withdrawal symptoms. By the age of 13 our patient has lost her three love objects; the mother and brother through death; the father, through marriage. Rivalry with the stepmother is frankly worked out. She regrets she did not treat the father more kindly, in which case he would have remained with her. Her response to the bitter reality with the loss of love and the unusually favored position in early life is a typical regression—lying in bed for days, avoiding all responsibility. But in the regression, the illnesses in her previous experience may now be utilized. Assuming, in spite of all the exposures to illness and the identification described, a good reality response,—successful achievement in work, happy social contacts, etc.,—the traumatic

experiences might very likely be transmuted in some form other than hypochondriacal symptoms. In regression, the all absorbing interest in oneself, increased phantasying, with the resulting further retreat, magnify the value of ego-libido on the principle of Freud's reciprocal relationship between ego and object-libido. The greater the withdrawal from social contact, that is, the greater the diminution in object-libido, the greater the increase in ego-libido.

A fourth set of factors in this case has to do probably more directly with our problem than the others; namely, the patient's pleasurable absorption with her own body sensations. In the Rorschach, it is shown in her response of viscera (lungs, stomach, "back where the lungs are"). She sits on the toilet for hours, smuggles books into the bathroom. As a child she was toilet-stubborn, resisting bowel training. As a child, also, many applications were made by the mother to her vagina. There is in our examinations throughout evidence of strong evaluation of her own body. Her sex reaction is typically anal-sadistic—she spurs boys on and then fights them off. She doesn't allow physical fondling or even physical examination—"What's mine is mine." Her body is inviolate. She has dreams of marriage in which instead of the sex act with her husband, there is a fight in which she is triumphant.

Without going into all the implications of these findings our evidence is ample to show marked enjoyment of body sensations. Through her early development of body narcissism, reenforced by well-developed erotogenic zones, we may now see how the regression is favored. It is libidinized. There are many reasons for the retreat in view of libido privation and loss of security in the new family; there are reasons also for the utilization through castration-fear, through identification and through actual death threats of the symptomatology of disease; but, it seems important that the retreat is made pleasurable through well-developed body narcissism. We have thereby a logical base for all the anxieties about illness to adhere (as in libidinized-anxiety). The question of individual susceptibility remains, as in all problems of psychogenesis. How to evaluate it is difficult. Our patient since infancy showed excessive emotional response, and now indicates strong vasomotor responses in the form of quick flushing and blanching; hence vaso-

motor response may represent a physiologic basis for her oversensitivity (?) to body processes.

Using the case discussed as a starting point we may organize our studies along the following lines:

1. Exposure to disease, deformity, accidents, deaths in others. Primary social factors. Disease coloring of the social milieu.
2. Patient's own memories of above and relation to the individuals affected by disease, etc.
3. Patient's own illnesses, contacts with physicians, hospital experiences, convalescent care, and the like.
4. Utilization of body ailments in avoidance of difficult situations, bid for sympathy, etc., exploitation of illness, real or imaginary.
5. Body sensitivities.
6. Anxieties about illness, including always response to masturbation threats.
7. Development of body narcissism,—erotogenic zones.

In the cases studied, the stress varies with the different factors. Certain tendencies appear sufficiently clear to be worthy of comment.

Ordinary sensitivities to variations in body form result in certain selection of interests regarding the body, compensatory strivings, and insufficiency feelings, in themselves unimportant in developing hypochondriasis unless utilized by other psychic mechanisms.

The sick milieu, *i. e.*, exposure to sick people and conversation, plus maternal oversolicitude appear to be the conditions most frequently found in cases of excessive body interest.

"Hypochondriacal" symptoms that have their source in castration fears or guilt formation based on sex activity are largely of the anxiety type; sometimes distinctly phobic. When frequent masturbation occurs they appear to be built up in some cases on the physiologic let-down symptoms following masturbation and appear especially in cases showing schizoid reactions.

All so-called hypochondriac symptoms appear to be secondary to various neurotic mechanisms except (theoretically) when body pleasure based on the erotogenic zones is unusually reenforced.

## FURTHER CASE STUDIES: HYPOCHONDRIACAL SYMPTOMS.

CASE 1.—(No. 1062.) Contacts March, 1929, to August, 1930. A girl of 16 referred because of numerous complaints of abdominal pain and of deafness, in the absence of physical findings. Symptoms were precipitated by a difficult school situation. Definite improvement largely through social therapy. History of consistent exposure to numerous family illnesses since infancy; of much contact with hospital and clinic through her own illnesses and operations (mastoidectomy, appendectomy); of early fears of convulsions, death, and later of sexual attacks; of limited social contacts outside the family because of maternal apprehension; of maternal oversolicitude, especially about health; of strong attachment to mother and father, of whom the latter has numerous gastric complaints.

CASE 2.—(No. 1173.) Contacts May, 1929, to August, 1930. A boy of seven, referred because of rebellious behavior, who attributes his difficulties to a mastoid operation and who shows unusual interest in viscera. Such interest is related to various sexual experiences including, especially, anal activity, sexual curiosity, and "incestuous" activity with the mother; to overt fears of death, disease and castration; to utilizing feces as a method of displaying hostility. His earliest memories concern the mastoid operation. History of strong attachment to an oversolicitous mother, who prevented patient's social contact with other children, who cannot kiss her child for "hygienic reasons" and who complains constantly of "nervous" symptoms; of a father with an atrophied hand; of a brother who is much interested in body ailments; of an aunt to whose illness and death he was exposed; of frequent contacts with hospital and clinic, and a mastoidectomy.

CASE 3.—(No. 1737.) Contacts May, 1930, to April, 1931. A 13-year-old boy whose outstanding symptoms are excessive worry and interest in body ailments. A long series of illnesses, prolonged hospitalization, residence in convalescent homes, and exposure to mother's constant complaints of illness feature his history. Since his experiences in convalescent homes were happy ones, with affectionate house-mothers and satisfying physical care, in marked contrast with experience at home, he utilized his illnesses and body sensations to prolong the child relationship and keep out of the difficult home situation.

CASE 4.—(No. 1737.) Contacts May, 1931 to present date. A boy, age 12, referred because of excessive day dreaming at school, who showed tremendous interest in illnesses and body sensations, and constant physical complaints. Another example of exploitation of illness for purposes of infantile care with satisfactory adjustment to school only while receiving special medical care.

## Significant data:

1. History of frequent illnesses and special care in "fresh air" classes. While he was in a special school for undernourished children where he received much physical attention including weekly tests and examinations,

he made good progress in school. Frequent colds; tonsillectomy at three and at six; circumcision at six; measles at nine; mumps at eleven; chronic bronchitis at eleven and a half; tuberculosis suspect; several weeks hospital care and then special school. Announced proudly, "I'm a lung case."

2. Until age six, brought up by grandmother who was unduly solicitous about illness; then by mother who is also too much concerned about health, yet distinctly hostile to patient. Stepfather frequently persuades mother to go to bed because of her fatigue and overexcitability.

When age six, patient's home was in the neighborhood of a psychopathic hospital. He used to crawl through the fence and had frequent contacts with psychotic patients.

3. Patient speaks at great length of his operations, hospital experience, the special school, of his gain in chest expansion, of the need to go some place to build up his health. He gives a long list of the foods that he likes, and tells exactly how they should be cooked.

No special evidence revealed of unusual response to masturbation or to bowel activity.

CASE 5.—(No. 1113.) Contacts April, 1929, to February, 1932. A boy, age 14, of average intelligence, referred because of school retardation and rebellious behavior, who demonstrates various hypochondriacal complaints related to masturbation and excessive introspection. (This case is selected from a number in which excessive masturbation plays an important rôle in the development of hypochondriacal symptoms.) Patient complains of fatigue, headache, dizziness, lack of vitality, fear of hernia (from having lifted something years past), various abdominal complaints and fear of appendicitis.

Significant data:

1. Excessive masturbation. Usually occurs at least daily in the afternoon after defecation, and is followed by fatigue, headache and dizziness and then sleep of about three hours. Masturbation favored by school retardation, since he refuses to go to school; spends much time in his room alone.

2. Difficulty in psychosexual adjustment. Doubts as to his sex rôle. Likes to masquerade as a girl and make telephone calls for dates with men, imitating (successfully) a girl's voice. Expresses frank envy of females. Instances of passive pederasty with boys; no sex contact with girls.

3. Withdrawal symptoms following a constant and unsuccessful striving for an important rôle derived largely through a strong rivalry with the younger brother in a two-child family, and strong hostility to a father whose attitude is very derogatory to him. Symptoms of his defeat are increasing withdrawal from responsible tasks, numerous omnipotence-phantasies, bluffing similar to pathologic lying, wild rebellious behavior (*e. g.*, dangerous speeding, and without a license, in his father's automobile), making a fool of himself at parties as self-appointed entertainer in wit and mimicry.

Patient's own medical history shows malnutrition (age three to six months?); developmental delay (walking without support at eighteen months,

first words at twenty months, and late dentition); measles and mumps before age four, both mild; operation for removal of foreign body from larynx; removal of tonsils and adenoids at four and a half years. Stuttering began at age five and cleared up apparently by age ten.

In regard to exposure to illnesses of others, we have only the fact that the mother cannot endure the sight of blood, for which reason she could not accompany the patient to the hospital at the time of his operation.

As compared with the other sample cases, the excessive response to body sensations in this case is not in relation with undue exposure to and experience with body ailments. The exaggeration and psychic utilization of physiologic "let-down" sensations following masturbation have to do with castration fears and sex doubts in which father, through severe corporal punishment, has contributed greatly to the general situation of defeat.

CASE 6.—(No. 1685.) Contacts February, 1929, to February, 1932. An example of a theoretically potential basis for hypochondriacal symptoms because of excessive pleasure and interest in body sensations with socially withdrawing tendencies.

A girl of 12, of superior intelligence, referred because of laziness, irresponsibility and rebellious behavior. The patient avoids all household tasks and spends every available hour reading books. She has been an omnivorous reader since age six, and has always kept to herself. While reading she is either sucking her fingers or chewing gum, arranging her book so that the free hand is stroking her hair. It is evident that a strong factor in the continued reading was the opportunity for continued sucking. Patient associates sucking and reading as inseparable.

Finger sucking started at four months of age. While at the breast patient twisted the mother's hair with the free hand, continuing the hair stroking also after the periods at the breast. After age three, she continued playing with mother's hair in the same manner.

Patient is very fond of kissing. Used to talk with a smacking of lips after each word and still makes many smacking movements while talking. Makes numerous other lip movements, pouting, lip sucking, lip licking, sucking movements, and sucking noises.

She describes the feel of her hair in great detail, and also tastes of food, and the sensations of chewing gum. She says, for example "Sometimes I have a crazy feeling I want chocolate. Just chocolate! It has such a nice, nice, nice, something nice about it. I like the trail of chocolate down my throat (et cetera, et cetera). I love chocolate wafers. I suck it for awhile and then I wobble it with my tongue and it seems as if it wobbles. I love to suck it, but not all the time because then I get sick of sucking. Then when I get to the end, I want to get rid of it and I want to get another and start sucking all over."

The excuse for presenting this case, even though hypochondriacal symptoms have not developed, is to complete theoretically the various sources of experiences adapted to the development of such symptomatology. They are:

1. Exposure in early life to numerous complaints of illnesses, invalidism, life-threatening experiences of others, or death.



2. Actual experience of frequent illness or operations, contacts with physicians, numerous physical examinations, actual life-threatening accidents, and the like.

3. Strong identification with an ailing person, or one who exaggerates body sensations, so that the sick milieu may be "incorporated" and thereby become one's own sensations, for which actual experience of disease may be especially reinforcing.

4. Exaggerated response to body sensations of a pleasurable degree through reinforcement of erogenic zones, especially when such activities are favored by relatively passive behavior, as prolonged sitting or lying in bed.

5. Hypochondriacal symptoms arising out of this service are favored by conditions previously described, and presumably become "libidized." Symptoms arising in this way represent "primary" hypochondriacal symptoms, in contrast with such symptoms derived primarily from identification as in 3, with whatever secondary gains in difficult situations or anxiety states, based on, typically, castration fears in which sexual sensations or physiological "let down" sensations are incorporated in the anxiety picture. Such hypochondriacal symptoms are largely of phobic variety.

6. Social situations in which actual illness or deformity is utilized as secondary gain, for the purpose of gaining love, recognition, or of avoiding unpleasant situations. The prolongation or intensification of symptoms in this way is then favored by the factors already enumerated.

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sive and neurasthenic conditions, in initial stages of organic psychoses, and in psychopathic states of all kinds. We no longer recognize hypochondria as a disease."

Ferenczi, Sándor: Further contributions to the theory and technic of psychoanalysis. Boni and Liveright, New York, 1927; p. 87. Ferenczi says that the conditions under which, following an illness, a "disease narcissism" will occur are as follows: 1. The powerful constitutional narcissism existing before the injury so that the slightest harm to any part of the body affects the ego as a whole. 2. If the trauma endangers life, that is, if it threatens the existence (the ego) in general. 3. Injury to a part of the body especially powerfully charged with libido with which the ego as a whole easily identifies itself, *i. e.*, injury to an erotogenic zone.

Ferenczi, Sándor: *Ibid.*; p. 118. In discussing a case of hysterical hypochondria, he explains the patient's abnormal bodily sensations as stagnation of organ libido on a constitutional basis, with a purely hypochondriacal and also a hysterical superstructure; others to ego-drives and ego-insults.

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#### DISCUSSION.

DR. FREDERICK H. ALLEN.—Dr. Levy's paper has thrown a great deal of light on the genesis of certain attitudes which are found in children, particularly those having to do with interest in their bodies and the development of hypochondriacal ideas. It is important to get a better understanding of how these ideas are formed and how they are influenced by attitudes which others have taken toward them. This is particularly true in relation to the physical symptom. It is interesting to study a child who has a definite physical defect and the degree of sensitiveness which the child has developed toward this defect. As we study the attitude which various members of the family have taken toward these things, we get a better realization why the child has had his interest focused on them in an abnormal way. A few years ago we studied at the Philadelphia Clinic a group of children who had gross physical defects. We were interested in the relationship between the degree of sensitiveness that the child had toward his defect and the attitudes taken toward it by various members of the family. In those cases where the parent, particularly the mother, had taken an objective, common-sense attitude toward the defect, we found that the degree of sensitiveness of the child to it was markedly less. In those cases where the parent was able to take the defect sensibly and was willing to accept the child as he was, realizing that even with this defect, he was going to be able to do a great many things, we found that the child was able to develop very much the same point of view

about it and was able to carry on with a much less sensitiveness than we found in children where parental solicitude and concern and anxiety had been stimulated to a high degree because of the handicap.

Occasionally the defect serves as a means and a justification for a parent to maintain a very infantile relation with the child. An interesting example of this came to my attention recently. A boy, through an accident had lost both arms. Before the accident he had been a fairly healthy youngster. Although the object of a great deal of solicitude from the mother who was a rather deprived person and who got most of her emotional satisfaction from her children. This boy had taken the place of an older brother who had died. Then the accident came and this boy had both arms cut off. From that time emphasis was placed upon the helplessness of the boy, and served to enhance to even greater degree the mother's solicitude toward him. This has continued at an extremely excessive level and has created in the mind of the boy a feeling of helplessness and all his attention has been focused upon his defect. The accident served as a means to justify the mother's keeping this boy at a very childish level. If it had been possible for the mother to adopt a more objective attitude undoubtedly there would have been a much less sweeping reaction to the injury on the part of the boy, and he could have made a much better adjustment to the handicap than he has made.

There is one other point in Dr. Levy's paper that I should like to stress. His method of examination provides an interesting illustration of the fact that when a child is placed in a favorable setting where the examiner adopts a friendly and uncritical point of view toward him, he will talk about the things which are important to him. In this way Dr. Levy has enabled the child to reveal and discuss his attitudes that relate to his body. He has been able to do this because of the uncritical situation in which the child has been placed.

DR. H. C. SCHUMACHER (Cleveland, Ohio).—Mr. Chairman, probably I can discuss this paper best by citing a case that was referred to the clinic, which I think illustrates very well some of the points which have been brought out.

This youngster, a boy of 13, was referred, because of a quite marked change in his personality. He was described by his parents as being very depressed. He complained of feeling like a criminal. He had all sorts of body aches.

Seemingly, about two weeks before the onset of this change in personality he had the flu, and as he was convalescing his physician called one day and noticed that the boy was masturbating. Thereupon he pulled off the bed-clothes and ordered the boy out of bed and back to school.

The youngster went to school the next day, and in the oral English class became very much confused in his recitation, so much so that the teacher said, "Why you must be crazy!" This certainly did not help the boy. He went home, and the depressive symptoms became very pronounced.

As one goes back in this situation, however, one finds that it was not of such sharp onset. This lad is the youngest of three children. The eldest, a college boy in his senior year, has been suffering ever since early childhood from various compulsive phenomena and phobias. In other words, this youngster was brought up in an atmosphere where considerable attention was paid to health, because this older boy's particular difficulty centered around the idea of contamination. If he touched anything, he would have to wash his hands. A towel dropped on the floor would have to be thrown away, and so forth.

The second child in the family is a girl, who as far as can be discovered is a perfectly normal youngster. Her reaction to her two brothers is, "Oh, they are just foolish! I don't pay any attention to them!" That is probably why she is getting along so well.

The mother over-protected this youngster very much. He was the baby, and even now he is known to throw his arms about her, cling to her and kiss her. At times he would crawl into bed with her and sleep in the parents' bed.

In our early interviews with this boy he brought out some very interesting things. One was his reaction to disappointments in school. I think a lot of these youngsters who tend to show depressions stand disappointments very poorly. I think in that fact is a hint for teachers in this business of setting prizes which only one child can win. He made much in his depression of his feeling that he was no good, citing his failure to win the prize.

The second very important point was a reaction to an experience a little earlier in his life. The family were too poor to dress him well. He was sent to camp two summers ago in a pair of knickers that were much too large for him, and the boys called him "Falling Drawers." He had a marked reaction to that, so much so that when the parents came to visit him, he refused to see his parents, and when forced to do so cried very much, but did not tell them how he felt about it. He told me that he hated them, that he didn't want to see them, he felt they were making his life miserable for him.

A third factor already mentioned was that of his masturbation, which had commenced some six months previously, but which was highly intensified by the fact that the older boy was taking a course in abnormal psychology and had been taken out to the state hospital to see some cases. As I said before, his marked interest in his own phenomena led him to talk much about the patients and the symptoms he saw and to discuss particularly the fact that most of them were chronic masturbators. This, he told the boy and his parents, was going to drive his younger brother crazy.

This boy has now had three such depressions. He becomes a bit hypomanic in the intervals, during which he plays very strenuously and wants to be with all the children whom he always avoids when he is depressed.

I wonder if there are not some interesting points here concerning education from the standpoint of family training, parental training as well as the point of view of the physician's interests and the teacher's interests.

Now coming to this boy's complaints of body symptoms, it seems to me there are several very interesting factors. First of all, as a youngster this boy was very much teased. He was the short and dark one in the family and was called "Darkie" and "Blacky" and "Dago." He had his interest, therefore, centered very early in childhood on his body, on his physical stature, on his looks, on his complexion. Secondly, his older brother's over-interest in things relating to health emphasized physical health symptoms. Thirdly, his masturbation, although carried on previous to his break, was particularly excessive during his depressed periods, when he would lie awake at night and masturbate almost constantly. There is possibly in that the basis of some neurasthenia, as an outgrowth of this excessive masturbation.

Then too, I wonder if the fact that in the somewhat hypomanic states he played so hard and became so fatigued didn't have some bearing on his later aches and pains which became so marked in his depressions; whether he doesn't really feel fatigued and now centers his thoughts on his own body symptoms more than would otherwise be the case.

A very interesting thing happened in this boy's case. He was coming along very nicely when he went to a reception for some youngsters, and the family, without their knowledge, had "spiked" the punch. He was a bit hypomanic at that time, playing very strenuously. As he told me, "I would catch the pitching of five boys." That evening, partially drunk, he began to feel that he was a very bad criminal, and his depressive symptoms all again made their appearance.

So my point is this: that one must take these early factors and precipitating causes into consideration in every single case in which there are disturbances of the kind I have mentioned.

DR. LEVY (closing).—I am very sorry this subject could not be opened to general discussion. I had hoped especially that Dr. Paul Schilder, who has done so much valuable work on this problem, might respond.

Dr. Allen mentioned the child's response to deformities, a subject which he has especially investigated and published. In this group I did not study children with severe deformities, excepting in the particular case mentioned.

He also pointed out a problem in technic, the method of stimulating the child's productivity during interviews. For the young children, play technic was utilized as a means of living out through play material their various social experiences.

The method of selecting these cases was through the psychiatric-physical examination, and through finding a large number of anatomical responses on the Rorschach Test, and through actual symptomatology. As you know, actual hypochondriacal complaints in children as a sole reason for referring them are rare.

Dr. Schumacher's most interesting case illustrating anxiety precipitated out of the immediate situation of masturbation is included in a number of case studies made for this investigation. For sources of body interest arising out of masturbation acts, I should like to note the following suggestions

from our investigation. First, excessive body interest arising out of anxiety symptoms due to masturbation threats; second, symptoms that arise out of feelings of guilt. Symptoms of excessive body interest arising in that way, it seems to me, go more in the direction of phobic symptoms with complaints related to fear-physiology—complaints of palpitation, of dizziness, headache and the like.

Another source is represented by symptoms of the physiologic let-down resulting from excessive masturbation. These are chiefly in the form of lethargy, complaints of inappetence, lack of energy, and the like. And finally, there remain the symptoms of regression. In the retreat from reality, we have a situation that fosters introspection, increases sensitivity to all body sensations and limits sexual pleasure to autoerotic forms, thereby like a vicious circle raising the value of the retreat.

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## PSYCHOSIS: ITS IMPORTANCE AS A PRESENTING SYMPTOM OF BRAIN TUMOR.\*

By LEO J. ADELSTEIN, M. D., AND MARTIN G. CARTER, M. D.

This study was stimulated by the relatively large number of cases admitted yearly to the psychiatric service of the Los Angeles County General Hospital, with a tentative diagnosis of psychosis of functional origin, later investigation or necropsy proving the diagnosis to be brain tumor with psychosis. It is not the object to present all the various types of mental disturbance invoked in tumors of the brain but rather to submit for consideration the question of psychosis as a presenting symptom.

Looking upon psychosis as a purely symptomatic manifestation of disease rather than an entity in itself, leads to a more rational consideration of what should constitute a careful psychiatric as well as neurologic examination. That a patient presents euphoria, hallucinations, delirium, depression, or even maniacal outbursts, expresses but one symptom complex of a possible underlying organic lesion. The average medical case is usually not diagnosed by one presenting symptom, yet there is no doubt that many cases of brain tumor with psychosis are placed in institutions for the insane for custodial care, the true nature of the trouble never being disclosed during life.

### INCIDENCE OF PSYCHOSIS IN BRAIN TUMOR.

That brain tumor as a disease entity is no longer uncommon has become more or less an accepted fact. Courville,<sup>1</sup> in a review of 6000 consecutive autopsies at the Los Angeles County General Hospital, found the incidence of brain tumor to be 1 per cent. Knapp,<sup>2</sup> in an earlier similar review of 5069 autopsies at the Boston City Hospital, found 101 cases of tumor of the brain. That psychosis as a presenting symptom is relatively common is not so well known. The United States Census Statistics for mental hospitals in

\*From the neuro-surgical service of Dr. C. W. Rand and the psychiatric service of Drs. M. G. Carter and C. L. Allen, of the Los Angeles County General Hospital.



1923<sup>3</sup> placed the incidence of brain tumor at .1 per cent. A review of the well-known Swalm's Index<sup>4</sup> from the State Hospital at Harristown, Pennsylvania, reveals 30 brain tumors out of 1638 autopsies. Blackburn<sup>5</sup> as early as 1903 discovered 29 cases of brain tumor out of 1642 autopsies at the Government Hospital for the Insane. More recently an interesting observation has been made by Davidoff<sup>6</sup> in reviewing the statistics taken from the New York State Hospitals over a five-year period, in that an average of less than one-half of 1 per cent of patients were clinically diagnosed as brain tumor cases; and on the other hand, among the specimens at the New York State Psychiatric Institute, approximately 6 per cent of brain tumors are found. With these figures in mind, the need for developing a broader outlook on mental disease *per se* becomes evident.

#### ETIOLOGY OF PSYCHOSIS ASSOCIATED WITH BRAIN TUMOR.

In 1888, Byrom Bramwell<sup>7</sup> divided the mental changes incident to brain tumor into two groups: (1) Irritative, and (2) paralytic. In other words, into symptoms which are associated with exaltation, or perhaps better with apparent exaltation on the one hand, and with diminution of function on the other. Among the former, that is, positive symptoms usually associated with exaltation of function, Bramwell lists alterations in mental disposition, irritability and unevenness of temper, crossness, the liability to be upset by trifles, oddness of manner or address, obstinate wakefulness, many emotional and so-called hysterical symptoms, delusions, hallucinations, threats or acts of violence, outbursts of excitement, or attacks of violence. Among the latter, that is, negative symptoms or those associated with diminution or abolition of function, the more important are intellectual impairment, loss of memory, want of attention, loss of power or mental application and concentration, listlessness, taciturnity, depression, melancholia, apathy, lethargy, want of attention to calls of nature, stupor, in short complete dementia and coma.

It remained Bramwell's contention that the cause of mental disturbances incident to brain tumor is either a widespread derangement of brain function or localized lesions in special parts of the brain; and he closes his discussion by saying "that in the present

position of our knowledge mental symptoms in brain tumor can hardly have any distinct localizing value."

In 1926 Baruk<sup>8</sup> divided the mental symptoms in brain tumor into two groups, with some effort to show localization. One group which includes mental retardation, disorientation as to time and space, and even fully developed dementia, he attributes to the generally increased intra-cranial pressure produced by the tumor, and does not regard as dependent upon an involvement of a particular region of the brain. The other group which includes euphoria, childishness, *Witzelsucht*, delusions, and hallucinations are focal in character, being determined by the particular region of the brain which is the seat of the tumor.

In 1929, Meyers<sup>9</sup> in a review of cases attempted to demonstrate that the increase in intra-cranial pressure does not of itself produce the mental disturbances associated with tumors of the brain, but rather that such mental aberrations are to be regarded purely as focal phenomena, being produced by an impairment of specific function in different regions of the brain.

With apparently any and all psychotic symptomatology having a possible organic basis in the nature of an intra-cranial neoplasm, what criteria have we for differential diagnosis? We believe the answer to this question lies in careful and *repeated* neurologic examinations, plus the diagnostic procedures such as perimetry, neuro-otologic examination, and ventriculography when indicated.

#### REPORT OF CASES.

CASE 1.—H. G. (L. A. C. G. H. No. 3031), a white male 42-year-old tailor, was admitted February 19, 1923, to the psychiatric service of the hospital for mental observation. For the previous three months he had suffered several attacks of acute mania and threatened the family with bodily harm. These attacks alternated with periods of euphoria in which the patient would jest, laugh uproariously at the most trivial of incidents and then end the episode by becoming exceedingly obscene. Further questioning of the relatives also brought to light the fact that the symptoms of headache, dizziness, and convulsive seizures had been present for at least two months.

On neurologic examination there was found a complete bilateral anosmia to camphor and peppermint. The fundi revealed marked choking of the optic discs to about 4 diopters of elevation with numerous hemorrhages on the right side. No evidence of any defect in the visual fields. The face showed a slight but distinct weakness on the left side. There were no other cranial nerve palsies. The deep reflexes were somewhat increased on the left side with a suggestive Babinski sign. Astereognosis was not present.

Skiagraphs of the skull showed no evidence of neoplasm. The blood Wassermann was negative. Due to the marked degree of choking of the optic discs, a spinal fluid examination was not made. Ventriculography revealed a marked foreshortening of the anterior horn of the right lateral ventricle.

With the above findings in mind, a tentative diagnosis of a possible right frontal lobe tumor was made and exploration advised. On May 10, 1928, Dr. Rand turned down a right frontal osteoplastic flap revealing a rather typical neuroglioblastoma<sup>10</sup> (spongioblastoma multiforme). Owing to the patient's poor condition, it was not thought advisable to remove the tumor at one session. A frontal lobe resection attempted three weeks later revealed the entire lobe to be infiltrated by a soft homogeneous tumor mass, with no line of demarcation. As much of the mass was removed as was possible. The case came to fatal issue one week later. Necropsy was refused.

*Comment.*—The acute psychosis in this case overshadowed all other findings to such a degree that psychiatric observation was immediately taken advantage of by the family. That this type of case is common, makes it imperative to have the psychiatric period of observation one of neurologic interest. This case probably falls well within the group referred to by Elsberg & Globus<sup>11</sup> as "acute brain tumor." Irish,<sup>12</sup> in a review of cases of brain tumor with sudden onset and rapidly progressive course, found that 90 per cent of such neoplasms are gliomas of the spongioblastic type.

CASE 2.—C. H. (L. A. C. G. H. No. 24838), a white 49-year-old housewife, was admitted to the psychiatric service on July 26, 1928 for observation, with a tentative diagnosis of epilepsy with psychosis. For approximately eight years previous to admission, the patient had suffered with epileptiform seizures of the grande mal type. Six months before admission to hospital she gradually developed a number of hallucinations, and delusions of persecution. A constant part of the psychosis included being pursued by spiders and flies. The patient finally refused to eat and drink, so it became necessary to provide custodial care for her.

Neurologic examination revealed a rather confusing picture. The pupils were dilated, the right larger than the left, with a tendency to conjugate deviation of the eyes to the right. The optic discs revealed a high degree of choking, of 3-4 diopters of elevation, with many hemorrhages. The other cranial nerves were found normal. The reflexes were spastic but equal, with a bilateral ankle clonus and Babinski sign. Stereognosis, and the visual fields could not be tested owing to poor cooperation. No cerebellar phenomena were elicited.

Stereo-roentgenograms of the skull revealed marked thinning of the posterior clinoid processes, suggesting erosion, due to marked intra-cranial pressure from some point extrasella. The blood Wassermann was negative. A ventricle study was carried out with the usual technique. The posterior

horn of the right lateral ventricle was tapped and 20 cc. of cerebro-spinal fluid removed, and 16 cc. of air injected. After closure of the wound the patient was sent to the x-ray department for the customary series of pictures. At this point she had a generalized convulsion, the pulse became very weak and rapid, and despite stimulation and artificial respiration rapidly went into coma and died.

Necropsy performed the same day revealed a large soft tumor located in the anterior portion of the corpus callosum. There was no hemorrhage into the tumor as was suspected before death. Microscopic examination revealed the neoplasm to be a typical neuroglioblastoma multiforme.

*Comment.*—This case presents many points of interest. The long history of epileptiform seizures with psychotic episodes certainly made the diagnosis of epilepsy with psychosis seem plausible. According to the statistics collected by Dowman & Smith,<sup>23</sup> and Parker,<sup>24</sup> the incidence of major epileptic seizures in cases of brain tumor ranges between 19 and 21.6 per cent, which should make "epilepsy with psychosis" only a tentative diagnosis and calls for careful analysis to rule out the possibility of an intra-cranial neoplasm.

The idea that ventriculography is a procedure devoid of danger has been long known to be erroneous. The practice of being prepared to go ahead with decompressive measures in the event of a complication as above outlined is justly correct, yet in this case the condition of the patient would not have withstood an ordinary decompression. Localization of the neoplasm was not possible. It was the opinion that the patient died in a convulsive seizure.

CASE 3.—N. M. (L. A. C. G. H. No. 253539), a 44-year-old white housewife, was admitted to the psychiatric service for observation August 26, 1926. Six years before admission she had been in an automobile accident suffering a head injury in which she had been rendered unconscious for several minutes. Since the accident, headache had been a more or less constant complaint, localized to the vertex. Her vision had been gradually failing for about one year, and three weeks before entry to hospital she became totally blind. At the same time, the patient developed a series of systematized hallucinations in which she saw constantly at her bedside a group of Chinese men and women, the thought of which tormented her greatly. There was no history of any convulsive seizures.

Neurologic examination revealed bilateral optic atrophy of the secondary type. Vision was entirely lost. Ocular movements were normal. The deep reflexes were hyperactive but equal. There was a bilateral ankle clonus and Babinski sign. The abdominal reflexes were present but diminished. Cerebellar phenomena could not be elicited satisfactorily due to patient's com-

pletely bedridden state. It was very difficult to make a satisfactory examination because of patient's fear of her hallucinations. This manifestation was thought to be temporal lobe in origin, but with no further evidence to confirm this suspicion. Before ventriculography could be attempted patient became suddenly comatose, and as a last resort a right subtemporal decompression was made but to no avail.

The blood Wassermann reaction was negative. Stereo-roentgenogram of the skull showed a possible separation of the lambdoid sutures. Necropsy disclosed a well circumscribed tumor of the vermis of the cerebellum, histologically an astrocytoma fibrillare.

*Comment.*—That psychosis may be present with tumors of the posterior fossa is not particularly unknown. But the association with systematized visual hallucinations is not so generally recognized. The part that hallucinations play in localization must be properly evaluated to avoid incorrect deductions. Deery<sup>25</sup> has recently reported two similar cases of tumors of the posterior fossa with visual hallucinations, from the New York Neurological Institute. If the hallucinations are part of a psychosis as was true in the above case, localization is impossible.

CASE 4.—M. F. (L. A. C. G. H. No. 282755), a 56-year-old white housewife, was admitted to the psychiatric service December 18, 1927, for observation. For the previous two years the patient had been suffering at irregular intervals with headache, dizzy spells, muscular weakness, difficulty in speech, and more recently from visual hallucinations.

Neurologic examination revealed bilateral choking of the optic discs with beginning secondary optic atrophy. There was a weakness of the left side of the body with increased reflexes on the same side. A marked ataxia of station and gait was present with the patient tending to fall to the right and backward. It was thought that there was at least a suggestive astereognosis on the left side. The fields of vision were generally contracted but with no definite characteristic defects. The hallucination which was present at all times and which distressed her sorely, consisted of three masked soldiers standing guard at the back of her bed or at her side. (Right or left could not be determined.) It was thought that the hallucination was part of the psychosis and had no localizing value.

Stereo-roentgenograms of the skull revealed no characteristic evidence of intra-cranial pathology. The spinal fluid examination revealed a marked increase in pressure and contained 44 lymphocytes.

The neuro-otologic examination gave markedly reduced responses from the horizontal and vertical canals on both sides with absence of all constitutional responses. There was no spontaneous nystagmus. A bilateral hearing defect was present. Ventriculography indicated a marked internal hydrocephalus with some bulging of the floor of the posterior horn of the right lateral ventricle. With a tentative diagnosis of a cerebellar tumor in mind,

a suboccipital decompression was made, revealing a large fairly soft tumor of the right cerebellar lobe, section of which proved to be an astrocytoma protoplasmaticum.

*Comment.*—This case demonstrates once again the association of a tumor of the posterior cranial fossa with systematized visual hallucinations. Localization was made possible only by the employment of ventriculography which immediately indicated the trouble to be below the tentorium. This was corroborated by the Barany reactions, which tests should be made in all cases even in the absence of any spontaneous nystagmus, which was the case as described above.

CASE 5.—M. B. (L. A. C. G. H. No. 97271), a 56-year-old colored housemaid, was admitted to the surgical service of the Los Angeles County General Hospital, January 23, 1930, for the removal of a large lipoma of the neck. Following the operation the patient developed severe and unremitting headache, became irrational, and began to suffer from visual hallucinations in which small animals, particularly snakes, were constantly at her feet. She became unmanageable and was transferred to the psychiatric service with the tentative diagnosis of a toxic psychosis.

Neurologic examination revealed bilateral choking of the optic discs of 4 diopters elevation. As far as could be determined there was a complete bilateral anosmia to camphor and peppermint. The left side of the face was definitely weaker than the right. The deep reflexes were diminished but equal. There were no pathological reflexes. The abdominal reflexes were absent. The hallucinations seemed to give the patient much enjoyment, and at times she actually laughed at the collection of animals on the floor in front of her.

Neuro-otologic examination showed hyperirritable responses (15 seconds on cold caloric) from all canals with marked constitutional reaction. Hearing was normal. The blood Wassermann was negative. Bilateral ventricular tap revealed very small ventricles, in fact only 7 cc. of fluid could be withdrawn from the right lateral ventricle and 2 cc. from the left side. 6 cc. of air were introduced and the usual series of x-ray pictures taken, which showed a peculiar filling defect of the posterior horn of the right lateral ventricle.

With the tentative diagnosis of a right frontal lobe tumor in mind, a right osteoplastic flap was turned down revealing the brain to be under extreme tension, but the neoplasm was not located. A large decompression was made in the bone flap, the wound closed, and patient returned to bed. The case came to fatal issue two weeks later.

Necropsy revealed a large soft infiltrating neoplasm evidently arising from the anterior and inferior portion of the splenium of the corpus callosum. Microscopic examination revealed the tumor to be a neuroglioblastoma multiforme (spongioblastoma).



*Comment.*—This case demonstrates very satisfactorily the type of brain tumor which makes its debut with a psychosis, and which if not carefully analyzed, results in the tentative diagnosis, which was made in this case, of toxic psychosis. The case also demonstrates the value and necessity of making the ophthalmoscopic examination of the fundi a part of the general work-up of every medical and surgical patient admitted to the hospital, regardless of the special service to which it may be assigned.

CASE 6.—H. S. (L. A. C. G. H. No. 151104), a white 39-year-old housewife, was admitted to the psychiatric service March 21, 1931, for observation. The patient, a talented musician, had always been emotionally unstable with definite alternating periods of depression and exaltation. Headache had been present for almost eight years. Since 1925, at the time of the death of her only child, she suffered from trance-like states at irregular intervals in which she talked with the child. For the past two years the husband had noticed a distinct change in character and suspected the use of drugs. Four months before admission, the patient developed difficulty in speech with rapid mental failure which caused the family to have her sent to the hospital for psychiatric observation.

Neurologic examination revealed marked choking of the optic discs of six diopters elevation. No other cranial nerve palsies. There was no nystagmus or deviation of the head or eyes. A right hemiparesis was present with considerable spasticity. The deep reflexes were increased on the right side with a suggestive Babinski sign. The abdominal reflexes were absent on the right side. There was no astereognosis. A marked ataxia of station was present, patient being unable to stand or walk. No hemianopsia could be detected on gross examination. The mental phenomena consisted of distinct *Witzelsucht*, and a pronounced anomia aphasia.

The blood Wassermann was negative. The stereo-roentgenograms of the skull revealed no characteristic pathology. The neuro-otologic examination (cold caloric) revealed hyperirritable responses (15 seconds) from the right side.

With the tentative diagnosis of a left fronto-temporal lobe tumor, a bone flap was turned down over the left frontal area revealing a large subcortical hard reddish tumor probably arising from the falx. Microscopic examination revealed the tumor to be a meningioma. A large portion of tumor tissue was removed and patient was returned to bed in fair condition. However, progress was downhill and the case came to fatal issue four weeks later.

Necropsy revealed in addition to the tumor in the left frontal area, three other meningiomas, one located in the right parietal lobe arising from the longitudinal sinus, one attached to the superior surface of the tentorium on the right, and one in the left occipital area.

*Comment.*—A study of the ventricular pattern in this case might have given a clue to the multiplicity of lesions present, but since



the clinical picture was so distinctly that of left frontal lobe involvement, it was thought unnecessary to subject the patient to ventriculography. Primary multiple meningiomas are not entirely uncommon but are met far less frequently than tumors of more malignant type such as the neoplasms of the glioma group, particularly the neuroglioblastomas (spongioblastoma multiforme).

CASE 7.—H. C., a white female 35-year-old nurse, was first observed by Dr. C. W. Rand at the Santa Fe Hospital, July, 1927. Differential diagnosis at that time rested between a primary psychosis and a possible intra-cranial neoplasm. The patient was extremely restless and at times irrational, would not cooperate in the examination, and one day, without warning, left the hospital against advice. She was admitted to the Los Angeles County General Hospital on August 25, 1927. A hard won history revealed the presence of headache and vomiting of nine months' duration. Double vision had been present for one month. She again left the hospital against advice, took an overdose of allonal and was returned to the psychiatric service in a semi-coma as a case of possible suicide.

Neurologic examination at this time revealed but few localizing signs of value. Bilateral choking of the optic discs, with some right exophthalmos, and a marked spasticity of the left side of the body with bilateral Babinski sign were the entire group of positive findings. The patient roused from coma long enough to refuse any and all operative procedures, and died on September 17, 1927.

Necropsy revealed a small, well circumscribed tumor mass in the right temporal lobe. Histologically the tumor represents an interesting type studied recently in this laboratory by Dr. Courville,<sup>18</sup> who has described it as a ganglioglioma, and who has noted that this type of tumor in the temporal lobe is accompanied by marked mental phenomena.

*Comment.*—This type of tumor has been studied by such observers as Bielschowsky and Henneberg,<sup>19</sup> and others, who have noted mental phenomena in their cases but have not apparently laid stress or significance on their presence.

While it is generally recognized that many patients with brain tumors show some degree of mental failure, it should be emphasized again that many cases make their onset with a psychosis. That such a large number of cases presenting psychotic episodes are passing through the clinic, has made it imperative that the cases be approached from a neurologic standpoint first, rather than dealing solely with the psychiatric end of the examination. With this in mind, each case as it is admitted to the psychiatric service receives early a complete neurologic check-up, and if indicated, the procedures of x-ray, perimetry and ventriculography are employed,

usually under the supervision of the neuro-surgical service. The psychosis *per se* is handled or analyzed after the neurologic work-up is complete.

The literature abounds with comment on the possible localizing value of mental symptoms in cases of brain tumor, and it is interesting to notice the vast difference of opinion among observers. Kubitchek<sup>18</sup> and Ikutaro<sup>19</sup> believe that psychotic phenomena are rare and have limited localizing value, while Vincent<sup>20</sup> believes that mental changes are of the highest significance, particularly in pathology involving the frontal lobes. Sachs<sup>21</sup> and Schwab<sup>22</sup> have called attention to changes in personality as being the most constant and important symptoms in frontal lobe pathology, and Bianchi<sup>23</sup> in his experimental studies has shown that destruction of the frontal areas leads to marked character changes. The childish propensity to jest (*moria*) or *Witzelsucht* has been elaborated by Bruns,<sup>24</sup> Oppenheim, and others, as indication of frontal lobe involvement, and was well exemplified in Case I in this series.

The various types of symptomatology in neoplasm of the temporal lobe have been amply described by Jackson,<sup>25</sup> Kennedy,<sup>26</sup> and reviewed recently by Kolodny.<sup>27</sup> Tumors in this location may give rise to visual hallucinations of the elaborated type. Jackson's first case "saw a little woman actively engaged in cooking." Kennedy reported a case in which the patient "saw a strange bad woman clad in rags." Horrax,<sup>28</sup> in 1923, in reviewing a series of cases from the Brigham Clinic, presented evidence that would seem to show that a "highly complex variety of visual hallucinations may be caused by tumors of the temporal lobe." Two cases reported in our series, with visual hallucinations had neoplasms in the posterior fossa. It is our belief that visual hallucinations as a localizing phenomenon must be critically analyzed before accepted. If the hallucination is part and parcel of a psychosis it has little or no localizing value. If it is a distinct entity in a patient presenting no other evidence of psychosis, it may be accepted as being of localizing value only if it can be corroborated or confirmed by other findings, such as a visual field defect, as so clearly outlined by Cushing.<sup>29</sup> In the cases presented here of tumors of the posterior fossa with hallucinations, as well as Deery's cases with similar findings, the explanation of Meyers<sup>30</sup> is to be considered, viz., the effect of pressure by the tumor mass on the corpora quadrigemina and geniculate

bodies. Russell Brain,<sup>30</sup> in a recent review of cases, concluded that "profound mental disturbances, including visual and olfactory hallucinations and dysphasia, might be produced by tumors in the posterior fossa, which were commoner in elderly persons than in children."

Auditory hallucinations which are truly of rare occurrence in cases of brain tumor are usually associated with lesions in the frontal and temporal lobes. In a review of cases at the Cushing Clinic, Courville<sup>31</sup> found that auditory hallucinations in association with temporal lobe neoplasms may be accompanied by hallucinations of sight, taste and smell. In cases of frontal lobe lesions, auditory hallucinations many times are part of a psychosis, and therefore of no localizing value.

#### CONCLUSIONS.

It is generally recognized that patients with brain tumors may show evidence of psychic disturbances, but that patients showing psychotic episodes may have tumor of the brain as the underlying cause has not been given its proper prominence in differential diagnosis.

1. The incidence of brain tumor as a clinical entity is approximately 1 per cent.
2. Psychosis *per se* may be the first presenting symptom in tumor of the brain.
3. All cases presenting a psychosis should receive a thorough neurologic examination to rule out a possible organic basis in the nature of an intra-cranial neoplasm.
4. Visual hallucinations are of localizing value only if distinct and apart from a psychosis.
5. Auditory hallucinations are of localizing value if separate and distinctly apart from a psychosis.
6. Mental phenomena associated with brain tumor may be regarded as focal in nature only if the neurologic examination will bear out the localization.
7. In the series of cases presented, the most marked mental changes were noted in those involving the frontal lobes and the corpus callosum, which coincides with the opinion of Gordon Holmes<sup>32</sup> that "lesions of the frontal lobe produce mental symptoms perhaps more frequently than those of any other part of the brain except the corpus callosum."

8. The various attitudes of the profession toward the brain tumor problem, particularly when it is complicated by the presence of a psychosis, is well summed up in the apt remarks of Holmes, who said that "divergence of opinion arose from the fact that the psychiatrist rarely found evidence of intra-cranial neoplasm in his patients, but the neurologist knew that a relatively large proportion of patients with increased intra-cranial pressure presented some abnormalities of mind."

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## A CLINICAL STUDY OF PSYCHOSES ASSOCIATED WITH VARIOUS TYPES OF ENDOCRINOPATHY.\*

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This study consists of a psychiatric and clinical-laboratory investigation of eight psychotic patients, with pronounced signs of various types of endocrinopathy, that were found in a population of 6000 at the Manhattan State Hospital. The hematological and basal metabolic studies, blood sugar determinations, sugar tolerance tests and Roentgenological examinations were carried out at the Manhattan State Hospital; the analyses of blood and spinal fluid for calcium, cholesterol, lecithin and inorganic phosphorus were done in the laboratories of Columbia University by Dr. F. Krasnow, and in the biochemical laboratory of the New York Post Graduate Medical School and Hospital by Dr. I. Rosen. All the specimens were taken under basal conditions early in the morning. This will have to be taken into consideration, especially in the evaluation of the white cell count.

We omit any reference to the literature on the subject, as one finds very few reports regarding psychoses associated with pronounced signs of endocrine dysfunction. We do not deem it advisable to refer here to the work done on dementia præcox with vague endocrine manifestations such as reversed secondary sex characteristics or variations in size and consistency of the gonads, for the question as to what extent the endocrine apparatus is involved in these cases is very vague, and the theories advanced by the various workers as to the etiologic possibilities in these combinations are not based on sufficient scientific proof and not infrequently are misleading. For the same reason we did not include in our study cases with vague equivocal endocrine signs.

### PSYCHIATRIC AND ENDOCRINOLOGIC CLASSIFICATION OF THE MATERIAL.

The study of the mental and physical syndromes of the eight cases resulted as shown in Table I.

\*From Manhattan State Hospital, New York.



There were three cases of schizophrenia. Amongst them, Case 1 had pronounced psychoneurotic features and presented a symptom complex of gonadal dystrophy-eunuchoidism. The second case a hebephrenic præcox showed a symptom complex of hypopituitarism (Frölich). The third case (No. 8), a catatonic præcox, has suffered from Basedow's disease for which the patient underwent a subtotal thyroidectomy and later developed a diffuse skin pigmentation and low blood pressure. There was one case of manic-depressive psychosis (No. 3) who, physically, showed a pronounced form of adiposis. One deteriorated epileptic in this group (No. 6)

TABLE 1.

Case.	Mental classification.	Endocrinologic classification.
1.	Schizophrenia with psychoneurotic manifestations.	Eunuchoidism.
2.	Schizophrenia, hebephrenic type.	Hypopituitarism (Fröhlich).
3.	Manic-depressive psychosis.	Adiposis.
4.	Hypophrenia with emotional instability and hallucinatory episodes.	Cretinism.
5.	Hypophrenia with emotional instability and hallucinatory episodes.	Pluriglandular dystrophy.
6.	Epileptic deterioration.	Hypo-ovarian obesity.
7.	Hypophrenia with emotional instability and hallucinatory episodes.	Pluriglandular dystrophy.
8.	Schizophrenia, catatonic type.	Basedow and Addison syndromes.

was a case of hypo-ovarian type of obesity. There were also three cases of hypophrenia with hallucinatory episodes of excitement and emotional instability. One of them (No. 4) was a cretin and the two others (Nos. 5 and 7) presented a syndrome of pluriglandular dystrophy.

#### CONSIDERATION OF THE LABORATORY FINDINGS.

The hematological study reveals a number of interesting data. With the exception of Case 8 there was an increased number of white blood cells in all cases. We consider the count of 8000 white blood cells in Case 1 as increased (moderately) as the specimens

were taken early in the morning, at least 12 hours after the last meal. In 4 cases the white cell count was as high as 12 to 14 thousands, the two highest occurring in a case of adiposis and in a case of pluriglandular-hypophrenia. The polymorphonuclear neutrophiles were in normal limits in all cases with the exception of the epileptic, who showed a rather moderately low percentage of 57. In only two cases (Nos. 7 and 8) was there an increase of the thrombocytes. The lymphocyte count was high in only one case—the hebephrenic

TABLE 2.

## TEMATOLOGY.

Case	Hem. per cent.	R. B. C.	Thromb.	W. B. C.	Polys. per cent.	Lymph. per cent.	End. per cent.	Eos. per cent.	Bas. per cent.
1	80	4,500,000	250,000	8,000	66	31	3	0	0
2	85	5,000,000	300,000	9,000	62	34	4	0	0
3	80	4,630,000	290,000	14,000	67	25	7	0	0
4	70	4,320,000	280,000	12,000	66	27	5	1	0.7
5	80	4,510,000	210,000	9,200	61	27	10	2	0
6	80	4,400,000	280,000	12,000	57	24	11	7	0
7	80	5,000,000	350,000	14,000	68	29	3	0	0
8	80	4,700,000	325,000	6,500	65	30	5	0	0

præcox (No. 2). In the rest of the group it was in normal limits. The eosinophiles were increased in the case of the epileptic patient. Worthy of note is the relatively low hemoglobin percentage in the case of cretinism (No. 4), which is not an unusual finding in this type of endocrinopathy. We shall consider the significance of the abnormal findings later when an attempt will be made to correlate all the pathologic findings.

## BASAL METABOLIC RATING.

The basal metabolic measurements (Table 3) show a few striking findings. In the case of the eunuchoid schizophrenic the basal metabolic rating was minus 23. In the case of cretinism (No. 4) it was minus 19.5. A similar reading was obtained in the hypovarian epileptic (No. 6). In two other cases (Nos. 5 and 8) the readings were only slightly above the positive end of the normal

scale. One of them was a pluriglandular hypophrenic (No. 5) and the other a catatonic præcox with Basedow and Addison symptoms (No. 8). The rest of the group showed normal readings.

TABLE 3.

Case.	Rating per cent.
1 .....	- 23.0
2 .....	- 2.8
3 .....	+ 2.3
4 .....	- 19.5
5 .....	+ 14.0
6 .....	- 19.0
7 .....	- 9.0
8 .....	+ 13.0

## FASTING BLOOD SUGAR AND SUGAR TOLERANCE.

The fasting blood sugar (Table 4) was in normal limits in 5 cases. In the other three it ranged from 130 to 150 mg., the higher figure being in the manic-depressive (No. 3), the lower one in the case of cretinism (No. 4), and in one pluriglandular hypophrenic (No. 7).

TABLE 4.

Case.	Blood				Urine		
	Fasting mg.	1st hr. mg.	2d hr. mg.	3d hr. mg.	1st hr. per cent.	2d hr. per cent.	3d hr. per cent.
1 .....	100	95	90	90	0.55	1.25	0.41
	112	110	80	80	....	....	....
2 .....	90	250	150	130	....	....	....
3 .....	150	220	250	220	1.0	....	....
4 .....	130	150	175	130	....	....	....
5 .....	100	140	190	140	....	....	....
6 .....	120	122	115	115	....	....	....
7 .....	130	180	120	120	....	....	....
8 .....	110	120	210	160	....	1.0	....

The sugar tolerance (Table 4) was low in two repeated tests in the case of the eunuchoid schizophrenic (No. 1) and, perhaps, to a less extent in the epileptic (No. 6). It was quite high in the hypo-pituitary schizophrenic (No. 2), and in the manic-depressive (No. 3) and in the catatonic (No. 8). A moderately high sugar tolerance was noted in one pluriglandular hypophrenic (No. 5).

In the other hypophrenic (No. 7) the sugar tolerance was in normal limits. In the case of cretinism the test may be also considered as of normal type.

#### CALCIUM.

The calcium analysis was made according to the Kramer and Tisdall method both in blood and spinal fluid and with the exception of an increase in the spinal fluid in Case 8 the findings may be considered as normal (Table 5).

TABLE 5.

Case.	Blood.	Spinal fluid.
1 .....	11.11	5.56
2 .....	11.75	5.31
3 .....	10.93	?
4 .....	10.57	5.82
5 .....	10.81	5.83
6 .....	10.76	5.26
7 .....	11.76	5.53
8 .....	11.07	7.10

Cholesterol determination in blood and spinal fluid was made according to the Myers and Wardell method (Table 6).

TABLE 6.

Case.	Cholesterol.		Lecithin blood.	Inorganic phosphorus (PO <sub>4</sub> ) sp. fl.
	Blood	Sp. fl.		
1 .....	185	6 +	242	1.6
2 .....	180	4 +	275	1.6
3 .....	166	?	232	?
4 .....	204	+	252	1.6
5 .....	190	+	262	1.6
6 .....	143	8 +	240	1.8
7 .....	158	+	220	1.4
8 .....	158	+	242	1.6

Considering  $171 \pm 16$  as the average for cholesterol in blood of normal people we find in only one case, of the epileptic, a rather low reading of 143 mg. per 100 cc. In the case of cretinism (No. 4) and in one hypophrenic (No. 5) the blood cholesterol was rather high, particularly in the former. In the rest of the group the readings were normal. Normally only traces of cholesterol are

found in the spinal fluid. The apparent increase in some of our cases (Nos. 1, 2 and 6) is explained by the fact that large specimens of cerebro-spinal fluid were used for the analysis.

Lecithin analysis in the blood and spinal fluid was made according to the method of Krasnow and Rosen (Table 6). The average normal for blood lecithin is  $242 \pm 22$ . In our cases there was only one instance with a high lecithin concentration in blood—275 mg. per 100 cc. (the hypo-pituitary schizophrenic—No. 2), and one with a concentration bordering near the lower end of the scale—220 mg. (the hypophrenic—No. 7). As is the case in normal individuals no traces of lecithin were discovered in the spinal fluid of our patients.

The analysis for inorganic phosphorus in spinal fluid was made according to the Tisdall method (Table 6). In only one case, of the epileptic, was there a slight increase of 1.8, the average normal being 1.59. The rest of the group gave normal readings except perhaps for a slight decrease in the case of one hypophrenic (No. 7).

#### CORRELATION OF THE PATHOLOGIC LABORATORY FINDINGS.\*

In Table 7 we have recorded only the abnormal laboratory findings. This material can be correlated in two ways: first a cor-

TABLE 7.

Case	Hem.	Thr.	W. B. C.	Polys.	Lym.	Eos.	Bas. met.	Bl. sug.	Sug. tol.	Cal. sp. fl.	Cho. bl.	Lec. bl.	PO <sub>4</sub> sp. fl.
1	..	..	mi	..	..	..	d	..	d	..	..	..	..
2	..	..	mi	..	i	..	..	..	i	..	..	i	..
3	..	..	i	..	..	..	..	i	i	..	..	..	..
4	d	..	i	..	..	..	d	mi	..	..	i	..	..
5	..	..	mi	..	..	..	mi	..	mi	..	i	..	..
6	..	..	i	md	..	i	d	..	d	..	d	..	i
7	..	i	i	..	..	..	..	mi	..	..	..	d	..
8	..	i	..	..	..	..	mi	..	i	i	..	..	..

\* i—increased; d—decreased; m—moderately.

relation of the greatest number of deviations in all cases; secondly, a correlation of the findings in each individual case.

The consideration of the first approach reveals the following results: An increase of the white blood cells observed in 7 out of 8 cases is correlated with an increase of the basal metabolic rating

in two cases (Nos. 5 and 8), increased fasting blood sugar in three cases (Nos. 3, 4 and 7), increased sugar tolerance in three cases (Nos. 2, 3 and 8) and increased blood cholesterol in two cases (Nos. 4 and 5). The white blood cells showed, also, a correlation in the negative direction; that is, a decreased basal metabolic rating in three cases (Nos. 1, 4 and 6), decreased sugar tolerance in two cases (Nos. 1 and 6) and a decreased blood cholesterol in one case (No. 6). It is interesting to note that between the white blood cells and blood sugar there was a correlation in one direction only; that is, an increase of both elements.

The consideration of the abnormal findings in each individual case reveals a decrease in the basal metabolic rating and sugar tolerance with an increased number of white blood cells in the case of the eunuchoid schizophrenic (No. 1). In the case of the hypopituitary schizophrenic (No. 2) there was a uniform increase in the number of white blood cells, the lymphocyte count, sugar tolerance and blood lecithin. In the case of the manic-depressive with adiposis (No. 3) there was a uniform increase in the number of white blood cells, blood sugar and sugar tolerance. In the case of cretinism (No. 4) the hemoglobin percentage and the basal metabolic rating was decreased, whereas the number of the white blood cells, blood sugar and blood cholesterol were increased. In the case of one pluriglandular hypophrenic (No. 5) there was a uniform increase in the number of white blood cells, basal metabolism rating, sugar tolerance and blood cholesterol. In the case of the hypo-ovarian epileptic (No. 6) there was a decrease in the number of polynuclears, the basal metabolic rating, sugar tolerance and blood cholesterol, whereas the number of white blood cells, the number of eosinophiles and the inorganic phosphorus in spinal fluid were increased. In a second case of pluriglandular hypophrenia (No. 7) there was an increase in the number of thrombocytes, basal metabolic rating (to a moderate degree) and number of white blood cells. Finally in the last case of the catatonic (No. 8) there was a uniform increase in the number of thrombocytes, basal metabolic rating (moderately), sugar tolerance and spinal fluid calcium.

Comparing the 8 cases with one another we find that the 3 schizophrenics showed no similarity of abnormal laboratory findings. In cases Nos. 2 and 8 the increase of various readings was distributed among unrelated elements. In the 3 cases of hypophrenia including

the cretinism there was only one correlation, namely the increased number of white blood cells; otherwise they showed no similar findings. With the exception of Case 8, the only constant factor observed in this group was an increased number of white blood cells.

#### CASE RECORDS.

CASE 1.—P. E. Hospital No. 82967. A 30-year-old male schizophrenic with pronounced psychoneurotic features and eunuchoidism, who had made a successful compensatory attempt along intellectual lines until the period of adolescence, when his efforts began to break down and the physical inferiority came once more to the foreground, this time leading to compensatory mechanisms of auto-plastic and allo-plastic character.

Patient belongs to a family considerably tainted with psychopathic traits. He was born in Austria, November 8, 1900. His physical development was retarded and enuresis persisted until the age of five. He grew very slowly but mentally he was bright and alert. Patient made considerable efforts to achieve high standing in school, this apparently as a reaction to his physical inferiority. At the age of 17 or 18 he was only about 4 feet tall and his sexual organs were underdeveloped. He never had an erection or seminal emission. Realizing his inadequacies he began to shun society of both boys and girls. At the same time he manifested a desire to overcome his physical handicap; he insisted upon consulting various physicians and was taking some gland product, and curiously enough, at the age of 18 he continued to grow and reached his present height of 66½ inches. Later, realizing that the treatment failed in its effect on his sexual development he became uneasy, fearful and more introverted. In his family circle he became fault-finding, irritable and quarrelsome. He had fits of temper which necessitated his hospitalization in April, 1924. At this time he was fearful, uneasy, expressed many hypochondriacal ideas and some phobias, such as fear of losing his eyesight. He would sleep considerably in the day-time. After a short residence in the hospital he returned home, made a few attempts to secure a gainful occupation but was unable to hold a position for any length of time. He then developed a rather marked regression, which lasted a short period of time, he spoke of being a baby (probably a rebirth fantasy, the motive of which would be acquisition of new genitalia). At about the same time his fears and phobias became more pronounced and in addition there were numerous compulsive phenomena such as necessity to wash his hands 11 times, uncontrollable impulse to yell, and counting his fingers. In a fit of temper he struck his mother, and was, therefore, again sent to the hospital, August 5, 1930. During this hospital residence he became more subdued and somewhat apathetic, yet when stimulated he readily reverted to his obsessional and compulsive reactions.

Physical symptom complex (Fig. 1): Eunuchoid habitus; height 66½ inches; weight 127 lbs.; sterno-iliac measurement 18 inches; ilio-malleolar 32 inches; head circumference 21½ inches; interpupillary space 2¼ inches.



Body contour of the semi-masculine type, the pelvic measurement being almost identical with that of the shoulders. Hair on the scalp abundant, soft and growing in the forward direction, quite low on the temples; very scanty in the axillæ, a few pubic hairs of the feminine type of distribution, and entire absence of hair on the chest and extremities; only a very slight down on the upper lip and chin (never shaved himself). Skin soft and velvety with rich vascularization from the pelvis down; nails underdeveloped and brittle. Adipositas of moderate degree. Slight convexity of the tibial and femoral bones; long upper extremities; slight torus; sella turcica enlarged in all directions (Fig. 1A). Median incisors spaced. Penis markedly underdeveloped, testes very small and soft. Voice high pitched. Blood pressure 110/70; pulse 62. Blood and spinal fluid Wassermann negative.

CASE 2.—H. Z. Hospital No. 81155. A 25-year-old male hebephrenic with hypo-pituitarism, whose psychosexual development remained on an infantile level leading to overt homosexual practices, in which the patient assumed the feminine rôle.

Patient was born in Poland, July 4, 1905, and brought to this country at the age of two. He was a weak infant, enuresis persisted until the age of 5. Made rather poor progress in school, failing in the 6th and 8th grades. At 14 he began to grow stout and to show feminine characteristics, at the same time becoming extremely fond of boys. He was greatly attached to his mother, followed her around wherever she went. At the age of 16 he would put on his mother's petticoats and corset. A year later he began to complain of insomnia and burning sensations in his abdomen. About the same time his homosexual tendencies became more pronounced. He would disappear once or twice a week, returning home with ladies petticoats, stockings and bloomers. He would also complain that boys were bothering him and forcing him into homosexual practices. It was then felt advisable to hospitalize him and he was committed July 12, 1923. At this time he freely spoke of his sexual activities, expressed bizarre fantasies, such as being pregnant. In the hospital he annoyed other patients, asking them if they loved him and if they admired his body. He would wear a cap which he made from a colored handkerchief. He was silly in his manner, laughed and smiled constantly and spoke of hearing voices. After a year's residence in the hospital he was released but had to be returned about a year later. After another year's residence he was released again but he soon resumed his homosexual practices and on one occasion, in November, 1929, after disappearing for a short while, returned home with two soldiers. A few weeks later he became unruly, threatening and was, therefore, returned to the hospital. This time he was rather childish in his behavior, slovenly in habits, rambling and circumstantial in his productions. He affected girlish mannerisms, embraced young patients, followed them to the bathroom, boasted that all the taxi-drivers in New York City knew him. At the present time he presents the picture of a mildly dilapidated hebephrenic; he uses cosmetics, speaks of deriving pleasure from homosexual practices and hopes to live some day with a man who will take care of him.

Physical symptom complex (Fig. 2): A pyknic type of habitus; height 60½ inches; weight 170 lbs.; sterno-iliac distance 18 inches; ilio-malleolar 32 inches; cranial circumference 22½ inches; interpupillary space 2½ inches. Skin velvety, with large patches of brownish pigmentation on the right side of chest and neck and to a lesser extent on the left side. Hair greasy on the scalp, low on the temples, heavy eyebrows, profuse on the face, forearms, legs, abdomen and axillæ. Adipositas increased in the supra clavicular region, breast, abdomen and hips. Round shoulders; abdomen pendulous. Bones short and heavy; sella turcica shows no evidence of erosion and is of normal dept; palate high; teeth in good condition. Alternant internal strabismus (since infancy). Blood pressure 124/82; pulse 94. Blood and spinal fluid Wassermann negative.

CASE 3.—H. W. Hospital No. 79577. A manic-depressive psychosis in a 42-year-old-woman with adiposis, the physical handicap leading to marital difficulties and compensatory mechanisms in the form of episodes of the affective type.

The patient was born in Mississippi, October 24, 1888. Seemed to have had an uneventful childhood; attended private school until the age of 18 and married shortly afterwards. Had two children and two miscarriages, one of which was induced.

Temperamentally she was pleasant, gentle and had many friends. Since the age of 20 patient began to gain excessive weight. At 34 attempts were made to remove some of the fat tissue through surgical procedure. During the operation, which had been performed under local anesthesia, patient became irritable and talkative; shortly after the operation she expressed a few delusional ideas against the nurses, then became elated and grandiose, promising great rewards to some and severe punishment to others. Her mental condition necessitated hospitalization in a sanitarium, where after 10 months residence she recovered. In the next 2 years patient's mood was fluctuating and finally she had to be again hospitalized. This attack lasted about 5 months. In the following years patient had similar attacks and finally had to be committed to the Manhattan State Hospital February 26, 1929. Although the main picture of her psychosis at that time was that of a manic excitement it is important to note that she expressed a trend against her husband, accusing him of running around with other women and being in league with the physicians in the institution. However, it was not difficult to ascertain the fact that her husband entirely lost interest in her and seemed to be rather satisfied at having her in the hospital. He felt that she was a great hindrance to her children, particularly to her younger daughter as the latter usually felt greatly embarrassed by her mother's presence when her friends called on her.

As the patient showed considerable improvement in this hospital she was again released and an attempt was made to adjust the family situation. However, all the efforts were in vain as the conflict between her and her husband was too great and she had to be returned to the hospital 5 months later in a state of pronounced manic excitement.

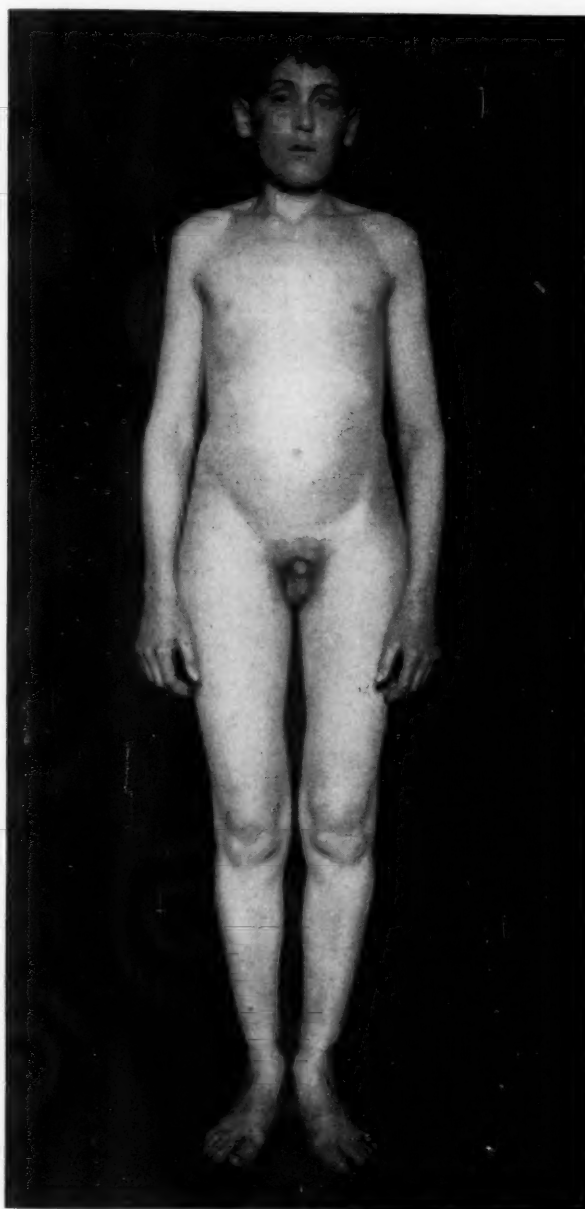


FIG. I.

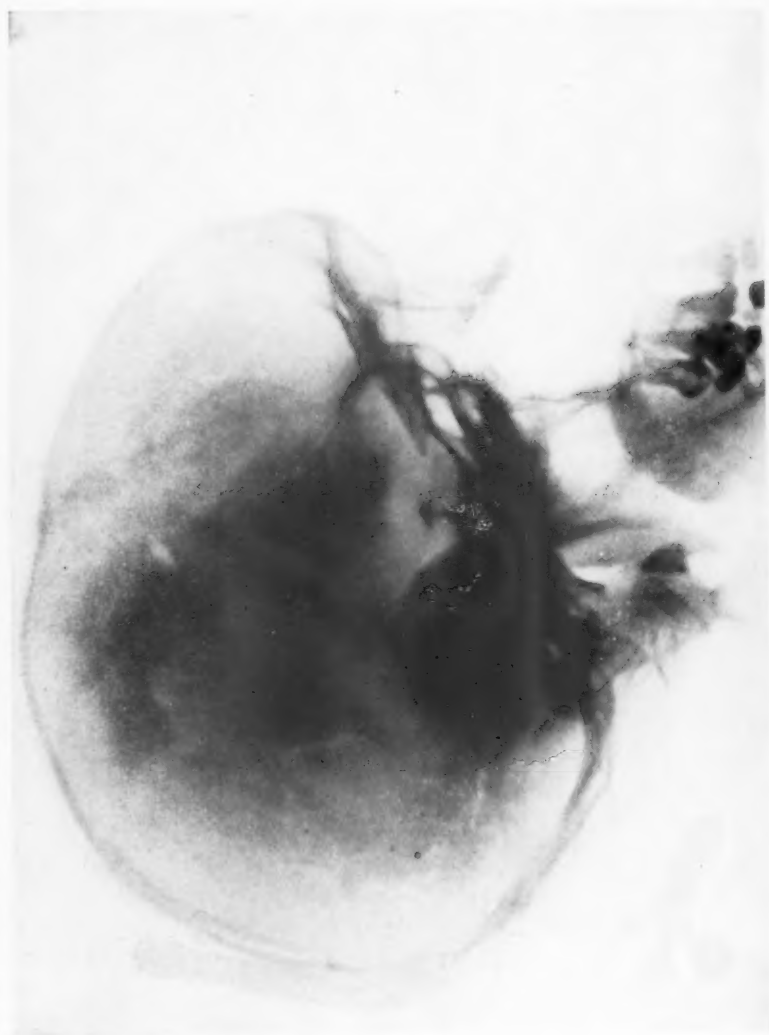


FIG. 1A.



FIG. 2.

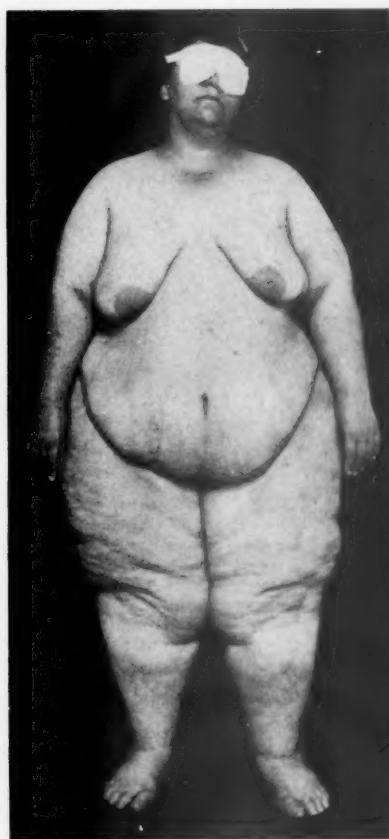


FIG. 3.



FIG. 3A.



FIG. 4.

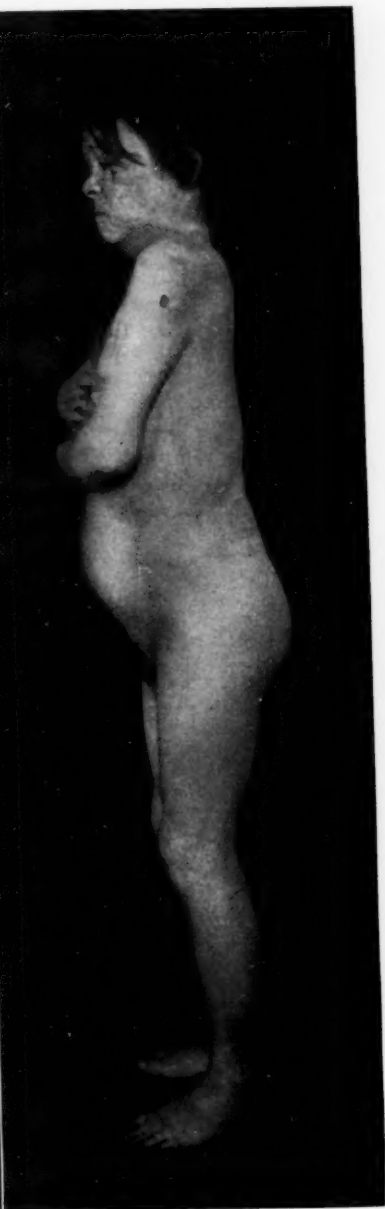


FIG. 4A.





FIG. 4B.



FIG. 5.



FIG. 6.



FIG. 6A.



FIG. 7.



FIG. 8.

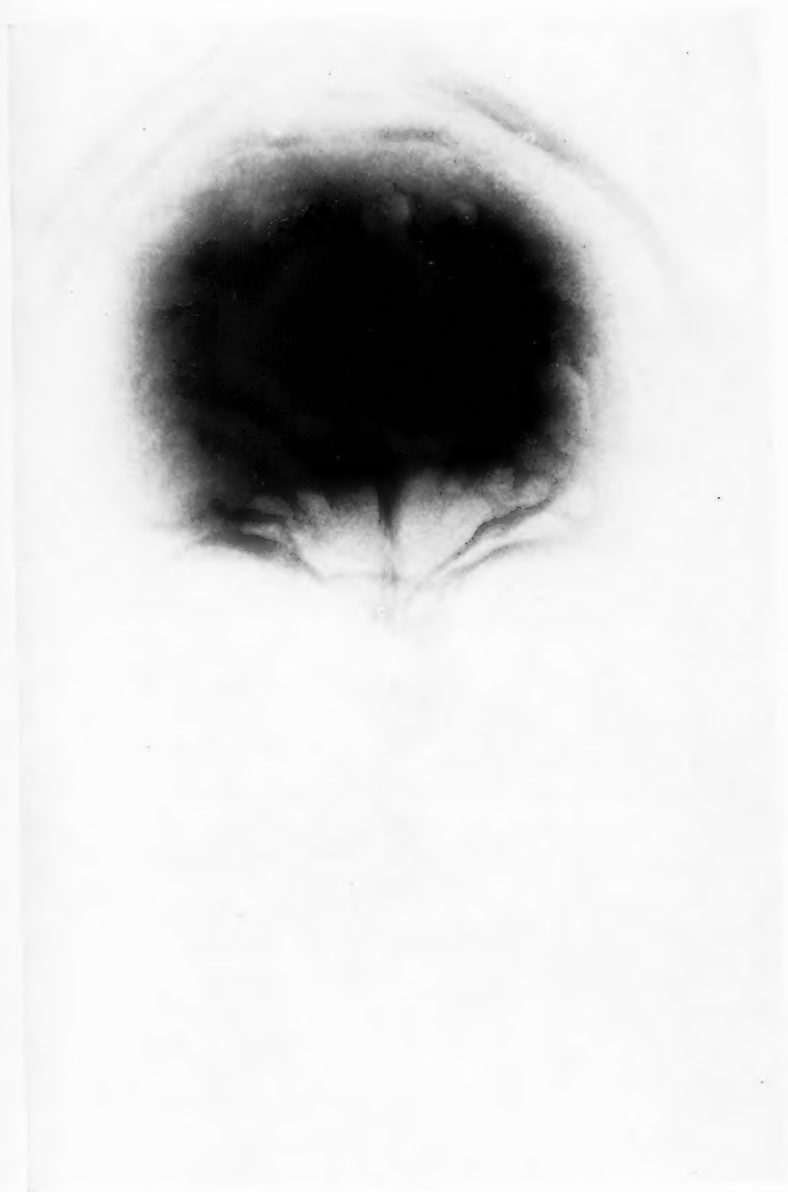


FIG. 8A.

v  
a  
o  
v  
n  
  
th  
st  
a  
je  
  
be  
gl  
m  
qu  
w  
co  
th  
an  
sh  
ha  
ha  
he  
sar  
W  
cre  
typ  
ilio  
24



Physical symptom complex (Figs. 3 and 3A): Weight 316 lbs. (previous weight 350 lbs.); height 60 inches; sterno-iliac distance 19 inches; ilio-malleolar 35 inches; head circumference 22 inches; interpupillary space  $2\frac{1}{2}$  inches; short neck. Skin smooth and moist. Hair abundant on the scalp, slight growth on upper lip and chin, present in the axillæ, a few hairs on the linea alba and present on the legs. Enormous masses of fat all over her body, except for the wrists and ankles. Mammary tissue present (patient menstruates). Bones: short, heavy; slight torus; sella turcica of normal size and depth; teeth in poor condition. Blood pressure 130/90, pulse 120. Blood and spinal fluid Wassermann negative.

CASE 4.—J. Q. Hospital No. 38291. A 41-year-old female cretin who following intake of thyroid preparations began to react with a hallucinatory paranoid form of excitement.

Patient belongs to a heavily tainted stock. She is the third of 5 siblings. It was necessary to use stimulation to revive her when born. As an infant up to the age of 7 she slept most of the time and but rarely cried. Her skin was cold and clammy and nose very red. She did not walk until 3 years old and did not talk until 5. She went to school for a short while and only with considerable difficulty and the greatest effort on the part of the teachers was she able to learn to read and write a little; she was unable to count money nor was she capable of doing simple errands for her mother.

Temperamentally she was markedly shut-in in the presence of strangers; in the family circle, however, she was more free. While she knew her age she always said she was a young child; she wanted to be a very little girl and wear short dresses. She was quite sensitive, quick tempered and very jealous of her younger sister.

In 1912 she was given thyroid preparations with the result that she became somewhat thinner, whereas before she was stout and flabby. She grew a little and became more robust. Emotionally, however, she became more nervous and excitable, her menstruation became so profuse and frequent that therapy had to be discontinued. In 1915 thyroid administration was resumed but this time, she began to hallucinate in the visual sphere, and complain that people were taking away different parts of her body, that they made her legs grow small and that her face changed. She became violent and was sent to the New York Neurological Institute for observation. As she made there homicidal threats with a knife, she was committed to Manhattan State Hospital February 12, 1916. In the hospital she reacted to hallucinations for a while, then quieted down, became indifferent, slow in her movements, would hardly respond to questions and has continued in the same manner, remaining dull, apathetic, occasionally mumbling to herself. With great difficulty can she be induced to do some slight tasks on the ward.

Physical symptom complex (Figs. 4 and 4A): Typical appearance of a cretin. Weight 78½ lbs.; height 53½ inches. Body contour of the masculine type, shoulders being wider than the hips; sterno-iliac distance 14½ inches; ilio-malleolar 28½ inches; head circumference 20½ inches; interpupillary space  $2\frac{1}{2}$  inches. Skin pasty; puffing of the eyelids. Hair silky, abundant on the

scalp, low on the forehead, a few on the upper lip, none in the axilla and very scanty on the mons veneris, a few on the arms and none on the legs. Moderate adipositas, more pronounced on the abdomen which is slightly protruding. Bones short, slight convexity of the tibiae; hard palate shallow and wide; sella turcica as seen in the roentgenogram is well rounded, not closed, and is normal in size in proportion to the skull; in the pituitary fossa there are irregular calcified deposits (Fig. 4B). There are no changes in the ossification of the long or short bones. Nose flat, short bridge. Breasts small with very little mammary tissue (onset of catamenia at 18, still menstruates). Blood pressure 100/80; pulse 74. Blood and spinal fluid Wassermann negative.

CASE 5.—A. D. Hospital No. 78611. A case of hypophrenia in a dysplastic pluriglandular female, 27 years of age.

Patient's father was alcoholic and died of a "stroke." Mother died of "paralysis," and two maternal cousins are hypophrenics. Very little is known of patient's infancy. She attended public school but had to repeat classes almost every year. Catamenia never established. Patient has always been childish and simple, good natured and docile. She was greatly attached to one of her sisters and a married brother with whom she was living after her parents' death. In December, 1926, her sister left the house following a quarrel with sister-in-law. The patient then became excited, cried a great deal and could not be consoled until the sister returned. When the sister left home a second time in September, 1928, the patient began to act in a peculiar manner, going into the streets waving her arms; she hallucinated in the auditory and visual spheres and had to be committed October 6, 1928. In the hospital she spoke of hearing voices and seeing things; she was irritable, restless and cried a great deal. She expressed vague ideas of persecution, was frequently stubborn and resistive; was given to violent fits of temper. An intelligence test rated her as 8 years 5 months old. In June, 1928, patient showed considerable improvement and she was released from the hospital July the 9th. Soon, however, she again became excited, strayed away and had to be returned to hospital October 6, 1928.

At the present time patient is mischievous, resistive, prefers to sit on the floor and cannot be induced to occupy herself in any manner on the ward.

Physical symptom complex (Fig. 5): A dysplastic habitus. Weight 100½ lbs.; height 50½ inches; sterno-iliac distance 15 inches; ilio-malleolar 26 inches; head circumference 20½ inches; interpupillary space 3 inches. Body contour of the masculine type, shoulders being wider than the hips; hair silky and abundant on the scalp, low on the temples, none in the axillae, very few on the mons veneris and none on the extremities. Skin velvety; nails underdeveloped. Bones short; fingers tapering; palate high arched; sella turcica of normal size. Fat tissue increased on the breasts and abdomen, to a lesser extent on the hips. No mammary tissue present (never menstruated). Horizontal nystagmus at extreme gaze to right and left. Pupils slightly unequal. Blood pressure 110/70; pulse 106. Blood and spinal fluid Wassermann negative.

CASE 6.—L. S. Hospital No. 53165. A case of convulsive state with hypovarian type of obesity in a 53-year-old woman.

Patient belongs to a family of rather large type of individuals. She is the fourth of five siblings, two of whom died in infancy, one during birth. There is no evidence of mental or nervous disorders in the ascendancy or collaterals nor history of convulsive incidents. At the time of her birth her mother was very ill. Patient was a large baby weighing about 10 lbs. A few hours after birth she had a few twitchings in the muscles of her face and throat. Twitchings in the same muscle group occurred at infrequent intervals in the next 48 hours. It is unknown when the patient began to walk; she was very slow in learning to speak, and for this reason did not enter school until she was 8 years of age. There she got along with great difficulty, was unable to keep up with other children in her class.

When 12 years of age, during a Fourth of July celebration, following an explosion of a large fire cracker, patient woke up from her sleep, seemed frightened and began to cry. She fell asleep again however, when another fire-cracker exploded, following which, patient fell out of bed in a convulsion. There were severe twitchings in her arms, legs and in her face. There was frothing at the mouth and incontinence. From that time on she had generalized convulsions sometimes every day.

Catamenia established when about 14 years of age for only a short period.

She grew up as a simple, childish type of girl becoming stouter every year. At the age of 19 she became so restless and irritable that she had to be committed, May 9, 1896. At that time she would answer questions in a monosyllabic fashion, was simple in her manner and had to be cared for in every way. She had frequent convulsions, sometimes 16 in 24 hours, all of the generalized type. After 8 months residence in the hospital she was discharged but readmitted again 4 months later, showing at that time more evidence of deterioration. There has been no change in her condition during the following years. As time went on she had fewer convulsions, even without any anti-spasmodic treatment.

Physical symptom complex (Figs. 6 and 6A): Short, heavy woman. Height 59.8 inches; weight 190 lbs. (previous weight 220 lbs.); sterno-iliac distance 18½ inches; ilio-malleolar 34 inches; head circumference 20½ inches; interpupillary space 1½ inches. Skin dry. Hair abundant and greasy on the scalp, very low on the forehead, present on the upper lip and chin, entirely absent in the axillæ, rather scanty on the mons veneris absent on the extremities. Masses of fat around the hips, on the abdomen, forearms and lower extremities including the ankles in contrast to the relatively slender wrists. Mammary tissue absent (does not menstruate). Bones: short, heavy, palate narrow and moderately high. Teeth in poor condition, mostly absent. Sella turcica of normal size. No neurological signs. Blood pressure 140/80; pulse 68. Blood and spinal fluid Wassermann negative.

CASE 7.—D. A. Hospital No. 77084. A case of hypophrenia in a dysplastic pluriglandular female of 30 years of age.

She is the second of seven siblings. Nothing abnormal was noted in her infancy until the age of 5 when she was sent to school; at this time it was

noted that the child was backward. Catamenia established at 15 and regular. Temperamentally she was docile, quiet and unselfish, there were no outbursts of temper. She was taught to perform certain tasks which she did willingly. Patient was getting along quite well until Thanksgiving Day in 1927 when she was frightened by a child wearing a mask. Patient was not the same since then. In the middle of January, 1928, she began to express delusional ideas; she saw shadows, became excited, remained in bed and refused food. On admission she was careless about her personal appearance, restless and meddlesome, laughed and mumbled to herself. Frequently answered at random. Later spoke of hearing her mother's voice and seeing pictures in the air; she was disoriented in all spheres. Her mental age is 4 years 8 months.

Physical symptom complex (Fig. 7): Weight 92½ lbs.; height 53½ inches; sterno-ilial distance 13½ inches; ilio-malleolar 29 inches; cranial circumference 20½ inches; interpupillary space 2½ inches; left sided scoliosis; feminine body contour. Hair curly, oily and, in places, gray, low on the temples, a few on the upper lip and chin, moderate in the axillæ, a few on the legs and feminine in type over the mons veneris. Skin velvety with a florid complexion. Adipositas more pronounced in the arms, thighs and legs and relatively little in the abdominal region. Bones short; fingers stubby; sella turcica of normal size; teeth are spaced, palate high and narrow. Mammary tissue present (menstruates). Slight pyramidal tract signs on the right side: right ankle clonus and an equivocal Babinski but positive Gordon. Blood pressure 122/80; pulse 80; thyroid gland barely palpable. Blood and spinal fluid negative.

CASE 8.—M. R. Hospital No. 76576. A case of catatonia with a possible combination of both thyroid and adrenal dysfunction in a 35-year-old woman.

Mother died of a paralytic stroke. Patient had an uneventful infancy; catamenia established at the age of 12. Temperamentally she was very sensitive, had considerable difficulty with the teachers at school and gradually developed a shut-in type of personality. In the early part of 1913 she began to talk in a peculiar manner, she laughed and smiled in a silly fashion and had to be committed to hospital. At this time she hallucinated a great deal. She recovered in about a year, but five months later she went into a catatonic state and had to be committed again, this time remaining in the hospital for a year and a half. Following this she got along fairly well for the next three and a half years, though given very much to day dreaming and abstraction. At that time it was noticed that she was easily tired out. In April, 1920, she had her third attack and was again treated in this hospital for about 14 months. At about this period patient began to gain considerable weight, weighing, in 1921, 200 lbs. After she left the hospital patient developed signs of exophthalmic goiter with a basal metabolism of plus 43. A subtotal thyroidectomy was performed in 1924. She married in April, 1925, and became a widow a year later when her husband was killed in an accident. Shortly after this she again became disturbed and had to be sent to the hospital. At this time large patches of pigmentation were present on the arms, chest, abdomen, thighs and legs. She weighed 160 lbs. and had a few signs of Basedow's disease. She recovered again in about 4 months and was released.

Soon she began to complain of fatigue and weakness and finally became actually psychotic and was sent to the hospital in October, 1927. Her weight was 160 lbs. Mentally she was talkative and somewhat childish in her behavior, expressed some trends against members of the family. Since then patient began to show evidence of deterioration.

Interesting is the variation in her weight during her hospital residence. In January, 1929, her weight was 190 lbs. gaining 30 lbs. since admission. At that time the basal metabolism rating was plus 28. During the year of 1930, patient began to lose considerably and reached her present weight of 113½. Her menses ceased and mentally she deteriorated completely.

Physical symptom complex (Fig. 8): Weight 113½ lbs.; height 59 inches; sterno-ilial distance 17 inches; ilio-malleolar 30 inches; head circumference 21½ inches; interpupillary space 2½ inches. Skin smooth with areas of increased pigmentation all over her body. Nails underdeveloped. Hair: silky, dark, abundant on the scalp, present on the upper lip and chin but none on the arms and with a feminine distribution over the mons veneris. Panniculus considerably decreased. Bones normal, X-ray of the skull reveals hyperostosis of the falx cerebri (Fig. 8A). Blood pressure 90/60; pulse 70. Blood and spinal fluid Wassermann negative.

#### COMMENTS.

This study indicates that the occurrence of psychoses in association with endocrinopathies of gross character is rather infrequent inasmuch as only 8 cases were found in a state hospital population of 6000 patients. The presence of 3 hypophrenics in this group reduces this number to a greater extent, as the endocrinopathies in mental deficiency are not infrequent and have to be considered separately from the cases of dementia præcox or manic-depressive psychoses because the emotional instability and the various episodes in hypophrenics do not offer such problems as the major psychotic reactions.

This infrequency seems to indicate that the relationship of the endocrine dysfunction to mental disorders has been overrated considerably, especially if we bear in mind the frequent occurrence of endocrine dysfunction without psychoses. When we consider the pathologic findings in our group we see that the laboratory deviations are of the nature we ordinarily expect to find in cases with definite endocrinopathies. The great stress which was put upon certain disturbances in the calcium and the lipin metabolism (cholesterol lecithin) and offered as a possible etiological factor in mental disorders does not seem to be justified as the deviations for calcium and lipins in such overt endocrinopathies as presented in this

study are rather minimal. Of course, one cannot deny the occurrence of some nondemonstrable changes in the metabolism of psychotic individuals or even in people with "personality deviations"; but on the other hand it is equally hazardous, at least for the time being, to accept as an etiological factor something concerning which we know next to nothing.

The consideration of the psychiatric aspect of our group of patients does not indicate a direct etiological relationship between the endocrine dysfunction and the psychoses except for the group of the 3 hypophrenics, where there is a constitutional anomaly of a congenital nature, which leads both to physical and mental aberrations. In the rest of the group there is no consistency of factors which would make one think of any causal relation between the endocrine dysfunction and the psychosis. The lack of any definite findings on which we could build up an organic etiology for our cases with the major type of psychoses does not mean that we should have recourse to psychoanalytic doctrines. It seems, however, reasonable to assume that in a number of our patients the physical handicap is tied up with the dynamics of the mental trend. Two of our schizophrenics and one of the hypophrenics capitalized their physical inferiorities in their psychoses. As we have seen the delusions were frequently of an autoplasmic nature having as their main theme the soma. We may say that they rationalized or compensated their physical handicap. The sex life also took a prominent place in the psychoses in some of the patients. We have attempted to give a sketchy interpretation of the reactions along these lines when the case histories were presented and we thought that it might help up to a better understanding of the patients; but we do not feel that the mere understanding of the dynamics alone offers a solution of the problem. It seems that the fundamental cause of the psychoses in this group of patients, especially in the schizophrenias still remains obscure.



## THE PSYCHIATRY OF ULTRAISM.

By BURRILL FREEDMAN, BROOKLINE, MASS.

The comparison between certain of the more radical manifestations of modern art and insanity is regularly made, and not without contumely, by the man in the street to whose attention the former happens to be called. Psychiatrists have also noticed the resemblance. Dr. Brill has asserted (*v. AM. J. PSYCHIATRY*, Jan., 1930, p. 716) that Gertrude Stein's writings cannot be distinguished from schizoid-manic productions. He adds that most of the writers who follow in her footsteps belong to the schizophrenic type who can barely maintain themselves. Dr. Coriat has remarked to the present writer that Gertrude Stein is undoubtedly schizophrenic. We may remark in passing that this opinion has scarcely been shared by her multitude of distinguished friends from William James to Sherwood Anderson and Alfred North Whitehead.

It is not only in literature that the phenomenon of ultraism is exemplified. It is to be found on the outskirts of every great movement: of literature, of music, of painting, of the plastic arts, etc. It is open for the layman to illustrate it in matters of dress. Partly, it approximates what might be termed normal variation; in part, it is certainly connected with the phenomena of eccentricity of every sort, of abnormality, and psychopathic personality.

To see the subject in proper perspective, we must realize at the outset that everything which has been loosely, or even soberly adjudged insane has not retained that stigma with the passing of time. On the contrary, the insanity of one age has often proved to be the genius of its successor. In recent times, we may point to impressionist painting, the music of Wagner, and much *fin-de-siècle* literature. The fact should teach caution in the interpretation and appraisal of anomalousness wherever it may turn up. Apparently this stricture cannot be too strongly made, and its importance gains ground the more we consider the profound interrelationship between cultural and moral values.

Artists have of course always been called neurotic. We inherit the phrase "divine frenzy" even from the Greeks. And there are



respects in which the works of artists even of secure reputation show neurotic and psychotic characteristics. It is not easy to exaggerate the significance of these points, but decidedly easy to misinterpret this significance. We have the example of Max Nordau, the disciple of Lombroso, expending his efforts in vain, under the banner of *Degeneration*, against the art of the *fin de siècle*. To-day, when the hygienic movement of the New Humanism is taking various exceptions to much of the same material as did Nordau, the latter's name is practically never invoked. The neglect is attributable at least as surely to the limitations of his psychiatry as of his taste.

It hardly requires mention that a pathological determination by no means necessarily impairs the value of a piece of work as art. The fact is that the artist, if he is also a neurotic, may be in a better position to describe the human soul than if he were mentally more sound. We might expect to find in the artist's description the "classic picture." And this we often do, as in the theater of the gifted modern dramatist Lenormand, whose *Le temps est un songe* is a powerful revelation of the soul of a young man afflicted with *folie de doute*; whose *Le mangeur de rêves* reveals the soul of the anxiety neurotic and the criminal, etc.

## II.

The difficulties in the way of a thorough comprehension of the relations between the artist and his art—to concentrate on that part of our chosen subject which is constituted by the field of art—multiply in the case of ultraistic art. Here we cannot be too careful in making sure that we at least know what was intended by the aspiring artist before we attempt to analyze. It is far too natural to assume, without making any great efforts to acquaint oneself with the aims of the individual or school, that none have been avowed, or that one is already cognizant of them. It should be obvious that the fundamental issues of the unconscious motivation can only be obscured by ignorance of the conscious and deliberate motivations.

In looking, for example, at the eccentricities of a certain picture by the 16th century master, Hieronymus Bosch, without knowing what it was supposed to represent, we might well be concerned about the painter's state of mind; but on being apprised that it

described "The Temptation of St. Anthony" we could perceive a perfectly intelligent striving behind it. The same necessity is even more pronounced in ultra-modern art like futurism, cubism, and vorticism. The shafts of light with which many paintings are shot through are significant of the innumerable perspectives which every situation contains within itself, so that the observation that such pictures would be just as good hung upside-down might be correct without necessarily being derogatory. The apparently incoherent collections of objects which make up the pictures of some artists can be understood in terms of more or less voluntary symbolism. Ultra-modern literature is particularly misleading. Joyce's *Ulysses* and T. S. Eliot's *The Waste Land* offer two of the most intelligible instances, in general owing their initial obscurity to the inclusion of the character's coconscious and unconscious thinking. The latest work of Joyce will be found intelligible only with the help of the realization that it is devoted exclusively to the sleeping life of its hero, where all the action is autistic cerebration with its condensations, displacements, and identifications. The music of Henry Cowell and similar composers cannot be evaluated psychologically apart from the explanations which they themselves have published concerning it.

Gertrude Stein deserves a separate paragraph. Her work is not to be associated with the stream of consciousness method on the one hand, or on the other with dadaism, which we shall consider further on. Her writing is not intrinsically homogeneous, as it may superficially appear to be, but embodies a number of different ideas. Of these we shall merely indicate two. From one aspect, it appears that she is not concerned with the vector quality of existence at all, but with its contemporaneity. The elements of her writing are then to be conceived as simultaneous, causally independent of one another; considered in a series, they are with reason incoherent. In still other writings, her style appears to reflect the more gradual nature which appertains to the progress of events not slurred over by consciousness. Being the hypostasis of a conceptual abstraction, writing of this sort would hardly be expected to correspond to anything very definite in material reality. The atomization of the stream of consciousness by unconscious complexes in the case of schizophrenics, and its blocking and perseveration in the case of retarded manics are thus only simulated in these two aspects of Gertrude Stein.

## III.

The possibility should not be overlooked that even in the absence of conscious motivations, any form of expression may possess artistic as well as documentary value. It is in illustration of this possibility that Nature has been called an artist. But leaving this matter as outside of our present province, we are next faced with the question of the unconscious motivation of ultraistic phenomena. And here we take notice of the fact that individuals of radical tendencies in literature and art are not uncommonly given to behavior which taken by itself is extraordinary. Corbière amused himself by going about in convict's clothes, fired revolvers out of the window to protest the singing of the village choir, appeared in Rome in evening dress with a mitre on his head and two eyes painted on his forehead, leading a pig decorated with ribbons. Gérard de Nerval walked the streets of Paris leading a pet lobster behind him.

The movement of dadaism exhibited the most instructive correspondence between literary and other forms of self-expression. Tristan Tzara, its putative founder, tells in his brief Memoirs of its extravagances. Tzara himself read a newspaper aloud before an audience while he had an electrical bell ringing so that no one could hear him. At another time six dadaists read proclamations on the same stage at once. A dadaist play was performed in a greenish light with the characters inside trunks and sacks reciting their parts without moving. A dadaist performed a motionless dance. Baeder, "the head of the dadaist religion," has been twice immured in an insane hospital, "by mistake," according to Tzara. He delivered an oration to three thousand persons when his wife died, in which he held forth that death was essentially a dadaist affair. Dadaists in Cologne held a free exposition in a public urinal.

As a literary movement, dadaism lasted between 1916-1921, but its influence has never wholly disappeared. A half-legendary Ducasse, writes Edmund Wilson in *Axel's Castle*, "half-buffoon but with a demon's energy . . . dashing down at top speed during his solitary nights a book of sadistic and scandalous visions (*Les Chants de Maldoror*) became the patron saint of Dadaism." Its importance is bespoken by its widespread invasion; for France, Germany, England, America, Russia, Holland, Spain, Italy, Switz-

erland, and Greece have all suffered dadaist activities. A second indication is the utterly disproportionate rage with which these doings have been resented. This comparatively innocuous kind of behavior more than once imperilled the lives of dadaists in France and Germany, and Czecho-Slovakia was obliged to drive out the dadaists and forbid demonstrations on its soil. The violence of these reactions suggests a sort of recognition on the part of the reactionaries that dada was making a seductive appeal to latent instincts in them; certainly converts were made of a number of persons who at first had been most passionately hostile.

It is worth our while to devote some attention to dadaism, for even apart from its own sphere of influence, we may see in it the mechanisms of phenomena which owe it no allegiance. Again, it was associated with such independent movements as cubism and futurism, such artists as Picasso and Modigliani. Apart from thinly veiled inanities like "Dada is against the high cost of living" and "Dada is a virgin microbe," we find among its manifestos: "Dada places before action and over everything: Doubt"; "Dada signifies nothing"; and "Dada is against dada." It cried down standards, traditions, conventions. Subjectivism ran rampant. As Tzara remarks, there were 391 presidents of dadaism, and anyone could become a president without the slightest difficulty.

It was primarily a malady of the soul, as is clear from statements like that of Breton: "We have never considered dada as anything but the rude reflection of a spiritual state, of which it has by no means contributed to the creation." The literary productions of dada amounted to automatic writing. Matthew Josephson writes disparagingly in *A Letter To My Friends* (v. *The Little Review* for Spring-Summer, 1926): "A new style was invented: by drinking quantities of beer and writing as fast as you could in competition with others after three or four hours you were so dazed that your subconscious began working." A fair example is the following by Tzara, which appeared in the same number of the *Little Review*:

cerebral flower faints on the list of the categories of the skies  
he is a star a convinced mandarin on a calling card  
deserts the physical twofold brilliance which cuts the hour with its scissors  
the spiral ether in the revolving door of respectful salutations . . . , etc.

## IV.

Let us see if we are in a position to understand the "spiritual state" of which these manifestations are but the "rude reflection." Daniel Rops in an informative series of essays, *Notre Inquiétude*, distinguishes between French dada deriving from Bergson and German dada deriving from Freud, and sees in the movement the struggles of young men caught between the passion for the absolute and the conviction of its unseizability. "The Bergsonian and Freudian soil in which dada grew," he states, "forbade stability; its reaction against rules cloaks a despair of rules." We must also take into account the discrediting of faith by science, which itself failed to reach especially comforting conclusions for most persons. Nor must the influence of the War be left out. Wilson (*op. cit.*) declares, "Their work was one of the symptoms of the social, intellectual, and moral chaos of Europe after the Armistice. The exhaustion of the resources of life had had the result of rendering desperate and sterile even the youngest generation of Frenchmen who had scarcely taken part in the fighting, but who had grown up in the atmosphere of the War."

There have been epidemics of analogous extravagances before in history. The Dancing Mania of the Middle Ages occurs to one. Various as have been the forms which they have taken in different places, times and circumstances, a certain common character is bound to strike us. Descriptively, they present a picture of expression or of self-expression which is glaringly anomalous, but in regard to which the category of strict insanity must be excluded by reason of the perfect orientation, insight, clarity of consciousness, and even capacity for independent social maintenance which accompany it. At the same time the character of being at once voluntary and occasional marks it off, although not definitively, from the regular picture of ingrained psychopathic personality. In these respects the epidemics and the perennial ultraism into which almost any movement may be expected to shade off concur, and it is natural to expect that the former are epidemics, in the usual sense, of a malady of which there may exist at any time isolated cases, or to which, predispositions.

Since no discussions of a scientific order presumably have been written on ultraism as a clinical entity, we are not yet in a position

to say exactly when ultraistic manifestations may be said to pass over into the realm of the pathological. Obviously, however, there is a point at which they can hardly be regarded as anything but unwholesome and undesirable. It will be helpful, if we can separate out a tentative syndrome for those cases which appear most definitely to lie beyond this point. Freud has pointed out that there are sometimes lodged in the ego disagreeable ideas which cannot be completely repressed, so that the individual does not become a neurotic; but which succeed in warping the ego and producing one of those persons called eccentrics. The situation with ultraism seems to permit of a diametrically opposite interpretation. Instead of elements foreign to the ego being added to it, we have the phenomenon of certain elements disappearing from the ego, more particularly from that part of it which represents the increments of the moral and social consciousness and has been termed by Freud the superego.\* The facts call strongly to our attention the living qualities of this part of the ego, which is under constant inducement to modification, and is perfectly capable of this when the moral and social support from those aspects of the outside world on which it has been accustomed to depend have been withdrawn. We should note that this abstract way of stating the situation is no more than a simplification of the facts which we have already observed in the case of dadaism, and which other forms of ultraism also demonstrate in abundance. We need only amend that ultraism may occur as well, as one type of symptom of an initial deficiency in the moral and social development.

## V.

The hygienic problems which arise from taking cognizance of ultraism as a clinical entity are, again, something which belongs more to the future than to the past. We may at least observe that they fall into the two classes, in the case of art, of the hygiene of the artist and the hygiene of the individual who exposes himself to or takes an interest in ultraist productions.

In regard to the first, the remarks of Lenormand in his foreword to Daniel Rops' book on his somber theater are valuable: "I do not believe," he asserts, "that one can decide the relations between

\* The two phenomena may, of course, be found in conjunction.



the artist and his art by identifying the two, but rather by setting them in opposition to one another. . . . Sometimes the piece of art rises up against the artist like a child rebelling against his father. Often the artist contemplates his work with the astonished gaze which an honest man might cast upon a son who has turned out a criminal, pondering on the defects he has transmitted without being tainted himself. . . . The work of art is only a discharge of the unconscious obsessions of the artist. . . . It is unlikely that he would ever commit the deeds of his characters. . . . The writer exorcises his demons in describing them. . . ."

The fact that Lenormand is not himself an example of ultraism does not detract from the appropriateness of his statements. But it is necessary to remember that catharsis as he exemplifies it is indicated only when those tendencies which are set free are not greater than can be rendered compatible with the ego or sublimated—as he, perhaps, succeeds in sublimating them. In other words, one could hardly recommend indiscriminately the catharsis of creative self-expression.

The hygiene of objective interest in ultraist productions is really a cultural as well as a psychiatric problem. The two points of view, however, meet on the common ground of the general social well-being of the community. The cultural background is, after all, the soil out of which psychiatric problems ultimately arise. Its influence is remote rather than immediate, but none the less actual on that account. The studies of Irving Babbitt and Paul Elmer More deserve mention in this connection. Employing the approach of literary criticism, they have attained a significance virtually clinical in their application of rigidly heuristic principles to the problems of human happiness suggested by comparative literature. Babbitt emphasizes what he calls the inner check as the distinguishing characteristic of human mentality as apart from the rest of nature. He traces many ills to the neglect or the denial of this function, his writings illustrating the mental discipline which they advocate. The neurologist, certainly, will recognize the nucleus of the inner check in the preëminent capacity for cerebral inhibition which characterizes the brains of the higher animals, and man *par excellence*.



## BLOOD CHOLESTEROL STUDIES IN MENTAL DISEASE.

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### INTRODUCTION.

Cholesterol is a monatomic, unsaturated, simple, secondary alcohol. Furthermore, it possesses the characteristics of a complicated terpene, which give it a unique position in the animal organism, since no other substance has been found to have so complicated a carbon nucleus except cholic acid, which alone is analogous. Although there has been built up an extensive literature concerning cholesterol, its exact constitution and much concerning its rôle in normal and abnormal metabolism remain to be solved.

### SURVEY OF LITERATURE.

This sterol appears in the human body both in the crystalloid and in the colloid forms. Its importance is indicated by its widespread occurrence in the tissues. Cholesterol is probably, therefore, a constituent of our innumerable animal foods, from which, it would seem, much of the cholesterol of the human body might be derived. Fraser and Gardner<sup>1, 2</sup> state that the phytosterols of plant foods are transformed into cholesterol in the body, furnishing a portion of the supply of this substance. The synthesis of cholesterol in the human body is at the present a disputed question. Lifschütz<sup>3</sup> feels that it can be synthesized from oleic acid. He also believes<sup>4</sup> that cholesterol holds some genetic relationship to cholic acid because the same color reactions can be obtained in both after oxidation with benzoyl peroxide. Goodman<sup>5</sup> while working on the possibility of changing cholesterol to cholic acid, noticed that if he injected cholesterol directly into the circulation it had but slight influence on the elimination of cholic acid. Rosenbloom and Gies<sup>6</sup> have also

\*Work conducted while Commonwealth Fund Fellow in Neuropsychiatry, University of Colorado Psychopathic Hospital, Denver, Colo.

discussed the possible derivation of cholic acid from cholesterol, but reach no definite conclusions.

"Cholesterol is present in the blood both in the free and in the combined state. Free cholesterol is present in the corpuscles and to some extent in the plasma alone."<sup>6</sup> The measurement of this substance met with very little success until Windaus<sup>7</sup> introduced the first procedure for its quantitative estimation. This procedure was dependent on the fact that the digitalis glucosid, digitonin, forms an insoluble compound with cholesterol, which may be filtered off and weighed. Since then there have appeared a number of different procedures of varying accuracy, all satisfactory for clinical purposes where only a rough estimation is required but few adequate for research purposes.

The cholesterol content of the whole blood in the human being is normally quite constant in amount only varying with age in the first and last decades of life, as a result of different pathological conditions and because of inaccuracies in the methods of estimation. Goldbloom and Gottlieb<sup>8</sup> found, in 138 infants and children, that cord blood of the normal new born contained a cholesterol content of 216 to 290 mg. per 100 cc. of whole blood; in normal infants under 3 years of age the blood cholesterol was 200 to 225 mg.; and in all children over 3 years of age the blood cholesterol was between 175 and 200 mg. per 100 cc. of blood. Bloor's method<sup>9</sup> was used by these workers. Chauffard, Laroche and Grigaut,<sup>10</sup> however, working with blood serum in normal children found normal values of 35 to 85 mg. per 100 cc. of blood. Gordon and Cohn<sup>11</sup> found in normal children of different ages a normal blood cholesterol of 110 to 170 mg. per 100 cc. of plasma. Baranska<sup>12</sup> in a study of 95 normal children found the blood cholesterol always within the normal adult range. DeToni<sup>13</sup> found values for normal children to be higher than those of normal adults. Rabinowitch,<sup>14</sup> in 44 normal children ranging from 3½ to 14 years, obtained blood cholesterol values ranging from 111 to 234 mg. with an average of 176 mg.

The normal quantity of cholesterol as measured in milligrams per 100 cc. of blood in the normal adult has varied much with different authors and different methods—so much so that W. Hueck of Leipzig in a meeting of the German Pathological Society in Wirzburg in 1925 at a paper on the metabolism of cholesterol stated that any one in order to do reliable work on cholesterol must define the limits

of error of his method. He states, moreover, that workers in this field are not justified in using the normal figures of others as controls but each should establish his own normal figures by the use of adequate controls. It is of interest and of value to know what figures have been considered as normal. Jacobi,<sup>16</sup> using the method of Myers and Wardell,<sup>17</sup> found a normal range of 150 to 200 mg. per 100 cc. of blood. DeCrisis,<sup>18</sup> with the method of Autenrieth and Funk,<sup>19</sup> obtained 130 to 150 mg., whereas the original authors of this method obtained 140 to 160 mg. Grigaut<sup>20</sup> found normals by his method to be 140 to 180 mg. Ornstein,<sup>21</sup> using the same method, obtained similar results with his controls. Forsyth,<sup>22</sup> using the method of Grigaut, obtained average normal values of 177 mg. Hellmuth<sup>23</sup> obtained values of 120 to 190 mg. with an average of 150 mg., using Bloor's method. Stenberg,<sup>24</sup> using the method of Bang,<sup>25</sup> found values ranging from 105 to 201 mg., average 153 mg. McClure and Huntsinger,<sup>26</sup> using Bloor's method, obtained 103 to 186 mg., average 139 mg. Oser and Karr,<sup>27</sup> using the method of Myers and Wardell,<sup>17</sup> obtained values of 110 to 190 mg., average 153 mg. Shaw and Sharpe<sup>28</sup> state that the amount of cholesterol in normal blood is 150 mg. Duncan<sup>29</sup> found a range of 145 to 199 mg., average 172 mg., and states that he used a normal range of 140 to 200 mg. Petersen and Levinson<sup>30</sup> present a range of 180 to 303 mg., average 222 mg. Gorham and Myers<sup>6</sup> feel that although the normal value of blood cholesterol is 150 mg., a value of 160 or 170 mg. would be more accurate. Bloor<sup>31</sup> states that the average for normal men is 210 mg. and for normal women is 230 mg., with a range for both 190 to 250 mg.

In mental disease there have been but few reports on the group as a whole. Tsuchiya,<sup>32</sup> in a study of 11 psychotic patients, reported them all as having normal blood cholesterol. Targowla, Badonnel and Berman<sup>33</sup> report 60 psychotic patients of whom 40 per cent had normal, 48 per cent increased, and 12 per cent decreased blood cholesterol estimations. Claude, Targowla and Badonnel<sup>34</sup> report blood cholesterol findings in 275 mental cases in which 45 per cent were normal (140 to 180 mg.), 60 per cent were increased (over 180 mg.), and 5 per cent were decreased (less than 140 mg.). Buchler<sup>35</sup> obtained the same results as Claude, Targowla and Badonnel.

## METHOD OF OBTAINING MATERIAL.

Upon admission to the Colorado Psychopathic Hospital wards or out-patient department, patients received venipunctures from which were drawn under sterile conditions 5 cc. of blood. This blood was placed in a sterile oxalate tube (oxalate equivalent to 2 cc. 1 per cent solution) which was immediately stoppered, up-ended several times, and placed in an ice box until needed. Tubes which contained any clotted blood were discarded. The blood for the controls was obtained from willing individuals, not patients, who were judged normal from a clinical neuropsychiatric point of view.

## METHOD OF CHOLESTEROL DETERMINATION.

The method used was a modified Myers-Wardell.<sup>17</sup> The blood in the oxalate tube was thoroughly mixed and 1 cc. of whole blood was transferred to a glass extraction thimble in which had been loosely packed, fat free, filter paper. This extraction thimble was placed in an oven in which the temperature varied between 70 degrees and 80 degrees Centigrade and dried for three hours. The extraction thimble was then placed in a 250 cc. Erlenmeyer flask with 20 cc. of C.P. chloroform. This flask was then attached to a water cooled reflux condenser and the blood extracted at 70 to 80 degrees Centigrade for 2½ hours. The chloroform and the material which it had removed from the blood were then transferred to a 25 cc. volumetric flask and made up to volume with chloroform at 20 degrees Centigrade. This flask was then placed in a water bath of 20 degrees Centigrade. Into each of two clean test tubes was placed 0.1 cc. of C.P. concentrated sulphuric acid and 2.0 cc. of C.P. acetic anhydride. To one tube was added 5 cc. of the "unknown" which had been made up to 25 cc. To the other was added 5 cc. of a standard solution of cholesterol in chloroform (5 cc. of standard cholesterol was equivalent to 0.4 mg. of cholesterol). To each tube was then added chloroform to a total volume of 10 cc. The tubes are again placed in a water bath at 20 degrees Centigrade and enclosed in a dark cabinet for 15 minutes. The tubes are then matched—the unknown against the standard by means of a Dubosque colorimeter and the number of mg. of cholesterol in 100 cc. of whole blood found by the calculation:

$$\frac{\text{Reading of unknown} \times 200}{\text{Reading of standard}} = \text{Number mg. cholesterol in 100 cc. of whole blood.}$$

Duplicate cholesterol estimations are run upon each specimen of blood. In no instance was it found that the number of mg. per 100 cc. of cholesterol run on the duplicate varied more than 5 mg. This variation was considered to be within experimental error of the method. The average of the two cholesterol findings was presented in each case.

#### METHOD OF EVALUATING RESULTS.

The total blood cholesterol values were handled entirely by means of a statistical technic which was judged to be the most scientific in dealing with the obtained data. By means of this tabulation there were determined: (a) M, the mean, or average, the best suited measure of the central tendency; (b) S.D. dis., the standard deviation of the distribution or the distribution on each side of the mean of the middle 68.26 per cent of the cases; (c) Q, the semi-interquartile range, or the distribution on each side of the mean of the middle 50 per cent of the cases; (d) P.E. mean, the probable error of the mean which is a measure of the reliability of the mean; (e) P.E. diff., the probable error of the difference between two means from which can be obtained the number of chances in a hundred that a true difference exists, that is one that could not be produced by chance. Frequency polygons and percentage frequency polygons were drawn in which the above facts are graphically shown.

#### RESULTS.

There are presented in this study the average cholesterol of duplicate determinations of 200 neuropsychiatric patients, and 54 normal individuals. It is felt that the neuropsychiatric reaction types are adequately represented although the frequency of cases is unevenly divided.

The entire group, 254 cases, is divided into two groups irrespective of sex, viz., "normal" individuals who presented themselves willingly as cases for this study and who it was felt presented no observable neuropsychiatric defects; and "not normal" individuals who were admitted to the out-patient department or to the wards of the Colorado Psychopathic Hospital for treatment of some neuropsychiatric disability. The material is presented in the form of tables and graphs.

Table I represents the incidence of cases in the various reaction types of mental disorder both neurological and psychiatric. The group of controls—normal cases—is likewise included.

Table II shows the distribution of total blood cholesterol measured in milligrams per 100 cc. of blood in the two groups of cases. For the sake of brevity the cases are grouped in frequency intervals

TABLE I.

No.	Diagnosis.	No. of cases.
1.	Normal .....	54
2.	Schizophrenia .....	33
3.	Neurosyphilis .....	32
4.	Senile psychosis .....	26
5.	Serious behavior problems of children.....	23
6.	Manic-depressive psychosis.....	17
7.	Psychoneurosis .....	11
8.	Psychosis with cerebral arteriosclerosis.....	9
9.	Chronic alcoholism without a psychosis.....	6
10.	Toxic psychosis .....	4
11.	No psychosis but with neurological condition.....	4
12.	Chronic alcoholism with a psychosis.....	4
13.	Epilepsy with a psychosis.....	4
14.	Epilepsy without a psychosis.....	3
15.	Psychosis with other brain and nervous disease.....	3
16.	Mental deficiency without a psychosis.....	4
17.	Mental deficiency with a psychosis.....	3
18.	Post traumatic constitution.....	3
19.	Encephalitis with a psychosis.....	2
20.	No psychosis, undiagnosed.....	2
21.	Constitutional psychopathy with a psychosis.....	2
22.	Constitutional psychopathy without a psychosis.....	1
23.	Meningitis .....	1
24.	Psychosis with somatic disease.....	1
25.	Brain tumor .....	1
26.	No psychosis, mal-adjustment.....	1

of ten. The first interval begins with 30 and runs through 39.9, the second begins with 40 and runs through 49.9, etc.

The Table III shows the relationship of the obtained statistical constants in the two groups of cases. Explanation of the meaning of the figures used is found elsewhere.

Table IV shows the necessary equations whereby it was determined whether or not a true statistical difference existed between

TABLE II.

Mg. of total blood cholesterol per 100 cc. whole blood.	Number of cases in the normal group.	Number of cases in the not normal group.
30 — 39.9 .....	0	1
40 .....	0	2
50 .....	0	8
60 .....	0	7
70 .....	0	13
80 .....	0	24
90 .....	0	20
100 .....	0	29
110 .....	3	8
120 .....	5	8
130 .....	6	12
140 .....	8	12
150 .....	11	8
160 .....	10	12
170 .....	5	4
180 .....	5	5
190 .....	1	3
200 .....	0	6
210 .....	0	2
220 .....	0	0
230 .....	0	1
240 .....	0	2
250 .....	0	2
260 .....	0	1
270 .....	0	2
280 .....	0	2
290 .....	0	0
300 .....	0	2
310 .....	0	0
320 .....	0	0
330 .....	0	2
340 .....	0	0
350 .....	0	2
Total .....	54	200

TABLE III.

Statistical constants.	Normal cases.	Not normal cases.
Number of cases .....	54	200
Range .....	110-195	30-350
M .....	148	129.3
P.E. mean .....	$\pm 1.70$	$\pm 1.53$
S.D. dis. ....	$\pm 18.70$	$\pm 32.02$
Q .....	$\pm 12.60$	$\pm 21.59$



the means of the two groups. If the equation D./P.E. diff. is 4 or greater than 4, then there are 100 chances in 100 that a true statistical difference exists. Here, this equation result was 9.12 which is

TABLE IV.

Groups compared.	Means.	D.	D./P. E. diff.	Chances in 100.	Statistical significance.
Normal group and	148.0 and	18.7	9.12	100	Exists
Not normal group	129.3				

greater than 4. Therefore, a true statistical difference exists between the means of the normal and the not normal groups.

Table V shows the range of normal cases and the number and percentage of the not normal cases as measured in milligrams per

TABLE V.

Group.	Normal	Not normal.
Number of cases.....	54	200
Range .....	110-200	30-350
Cases within normal limits.....	54	72
Cases below normal limits.....	0	104
Cases above normal limits.....	0	24
Cases below mean of normals.....	0	143
Per cent of cases within normal limits....	100%	36%
Per cent of cases below normal limits....	0%	52%
Per cent of cases above normal limits....	0%	12%
Per cent of cases below mean of normals..		71.5%

100 cc. of whole blood. It also shows the number and percentage of cases in group not normal which fall within, above and below the limits set up by the normal group.

#### DISCUSSION.

There have been very few studies upon the total blood cholesterol as related to mental aberrations as a whole. There have been no comparative studies between a total group of normal individuals and a total group of individuals considered clinically as not normal neuropsychiatrically. It is felt that no study upon total blood cholesterol is complete unless such knowledge be presented. Inasmuch as subsequent studies will be devoted to increasing fineness of analysis, the foundation of all the future accumulative work fundamentally rests upon this presentation.

The statistical procedure is used throughout in evaluating the results because of the ease with which the results can be grasped and

because of the realization that it is the method of growing scientific choice. Mathematically the results are factual and capable of ultimate combination with similar facts of other workers who use the same method. It is necessary to establish a procedure of this sort in order to stimulate the elimination in the future of such chaotic results as now exist. The only possible errors which creep into such attempts at stabilization of results are those arising from inaccuracies of the clinical and of the laboratory procedure.

The mean value ( $\bar{M}$ ) of blood cholesterol for 54 normal individuals was 148 mg. per 100 cc. whole blood with a probable error (P.E.m) of  $\pm 1.7$  mg. This means that the true mean or average probably lies somewhere between the values 146.3 mg. and 149.7 mg. The calculation of this figure permits one to use a method of determining whether or not any real difference exists between any two means as well as showing the central tendency of cholesterol as measured in milligrams in normal individuals.

The standard deviation of the distribution (S.D. dis.) for normal individuals was  $\pm 18.7$  mg. It is a measure of the variability of the material and at the same time an expression of the probable deviation from the mean of any individual chosen at random. It gives, moreover, the range of the blood cholesterol estimations of the middle 68.26 per cent of the cases—a range of 129.3 to 166.7 mg. The blood cholesterol of a normal individual picked at random has two chances in three that it will fall within the limits set up by the standard deviation.

The semi-inter-quartile range ( $Q$ ) for normal individuals was 12.6 mg. This, too, is a measure of the variability of the material and at the same time an expression of the probable deviation from the mean of any individual chosen at random. It gives the range of the blood cholesterol estimations of the middle 50 per cent of the cases—a range of 135.4 to 160.6 mg. In this range a normal individual picked at random has one chance in two that he will fall within the limits established by  $Q$ .

The entire range of the cholesterol values for normal individuals was 110 to 195 mg.

Thus, it is fairly obvious that the range of values and the mean value of blood cholesterol are similar to those found by other workers.

As contrasted with the normal group, in the group of 200 individuals considered as not normal, from a clinical and laboratory

standpoint, the statistical values were: the mean (M) 129.3 mg. with a probable error (P.E.av.) of  $\pm 1.53$ . The standard deviation of the distribution (S.D. dis.) was  $\pm 32.03$ , making the range of the middle 68.26 per cent of the cases 97.27 to 161.33 mg. The semi-inter-quartile range (Q) was  $\pm 21.59$ —a range of 107.71 to 150.89 mg. The entire range for all cases in this group was 30 to 359.

From the above material the comparative variability of the two standard deviations was obtained. It was found to be 1.7. This

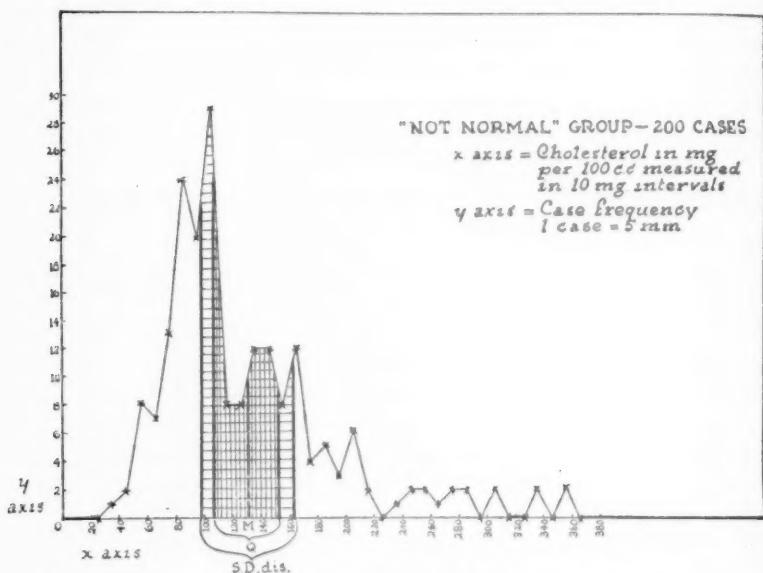


CHART I.—This frequency polygon shows the distribution of the 200 not normal cases. The mean, standard deviation, and the semi-inter-quartile range are included.

means that the variability of blood cholesterol of not normal cases is 1.7 times as great as the variability of normal cases.

The probable error of the difference of the two means (P.E. diff.), of the normal cholesterol and the not normal cholesterol with reference to mental disease, is 2.05. This figure when used to divide into the actual existing difference of the two means gave a figure of 9.12, showing that there are 100 chances in a hundred that a true statistical difference exists between the two means.

The above material is graphically represented by means of the frequency distribution polygons of both groups on Chart 1 and 2. These polygons cannot be directly compared because of the

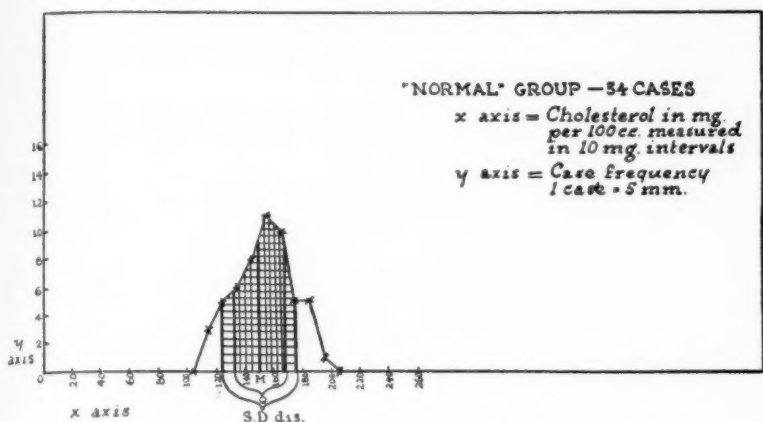


CHART II.—This frequency polygon shows the distribution of the 54 normal cases. The mean, standard deviation, and the semi-inter-quartile range are included.

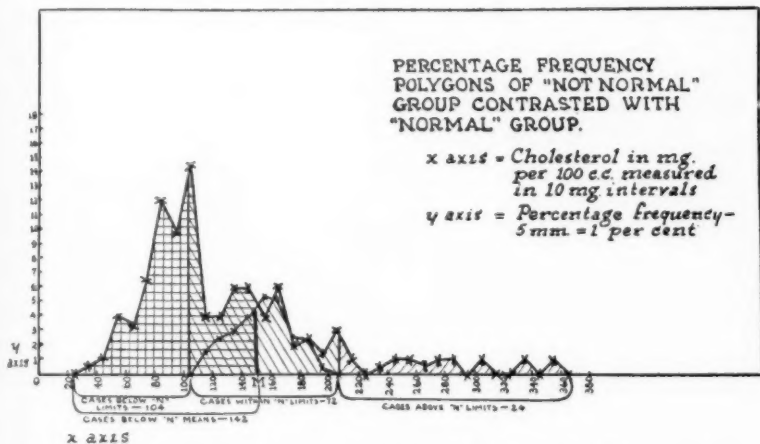


CHART III.—These percentage frequency polygons permit comparison of the normal and not normal groups. The normal mean is included. The number of cases in the not normal group which are below the normal mean, within the normal range and above and below the normal range are shown.

different number of cases. In order to facilitate comparison Chart 3 has been drawn in which the percentages within each class interval of that particular group are shown.

It is interesting that although the mean value of the normal group was higher than the mean value of the not normal group, the range of cholesterol estimations in the latter group covered a far greater area than the range of the normal group. This range of the not normal group started far below that of the normal group, included the normal range and also values far greater than those of the normals. There were of the not normal group, 52 per cent below normal range, 36 per cent within normal range and 12 per cent above normal range. These facts are of definite interest and point to disturbed cholesterol metabolism, speculation upon which is beyond the scope or purpose of this work.

#### SUMMARY.

There have been presented the total blood cholesterol estimations, as measured in 100 cc. of whole blood, in 54 normal individuals and in 200 individuals not normal from a neuropsychiatric point of view.

These two types of cases were considered as two distinct groups and the material evaluated accordingly.

The evaluation of the results was carried out by means of a statistical procedure.

The author wishes to acknowledge his appreciation of the assistance of Dr. George S. Johnson, Acting Director of the Colorado Psychopathic Hospital; Robert C. Challman, psychologist; and Miss Rachel D. Frame, in the preparation of the manuscript.

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## Notes and Comment

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DR. GEORGE ALDER BLUMER.

It is a pleasure to present in this issue certain correspondence relating to our senior editor *emeritus*. With this is accomplished a cherished plan of bringing to JOURNAL readers something of the life stories of the three pioneer workers who have previously occupied the editorial chair and are still active members of the Association. When it is recalled that the professional relationship and friendship of these three gentlemen date from half a century ago, it will be realized that none is so well qualified to speak with knowledge and authority of one of them as another of themselves. To the necessary conspiracy we have felt emboldened and justified by the ends in view, even at the cost of possible embarrassment to the subjects of the sketches themselves—a matter which Dr. Brush has so gracefully touched upon in his present letter.

A man's work cannot be considered apart from the man himself; indeed it may be impossible to understand the work without a knowledge of the personality behind the achievement. And this holds for science as well as for art. Whether a man is an organicist or a functionalist, a behaviorist or a psychoanalyst, or perchance a middle-of-the-roader, probably depends less upon the superiority of this or that theory than upon the personal bent of the theorizer. Many a scientific treatise could be better judged if there were available in a foot-note on the title page a thoroughly accurate thumb-nail delineation of the personality of the author. Is not in truth an essential aspect of criticism the endeavor to trace the author in his works?

Be this as it may, it is good to know the lives of the men whose works we know; and here are lives that are worth the telling.

The first biographical sketch, that of Dr. Richard Dewey, was written by Dr. Brush for the September, 1931, issue of the

JOURNAL. Dr. Dewey's name stands at the head of the list of life members of the association; and the record of his life demonstrates how much and how varied achievement the days of a man's years may contain if a tireless spirit urges him on. Particularly to be recalled is Dr. Dewey's foundation work in developing the "cottage" plan for mental hospitals, which dates from the eighteen-seventies.

In the JOURNAL for May, 1932, Dr. Blumer wrote of Dr. Brush, whose unequalled length of service as editor is one of the precious chapters of Association history. On that occasion, in commemoration of his eightieth birthday, Dr. Brush granted our request that he should sit for a special photograph, which we might publish together with another portrait of a bearded gentleman who was Dr. Brush at the beginning of his psychiatric career. Between these two pictures which accompanied Dr. Blumer's letter, intervene 54 years. The chronology printed with one of them attests for our guidance which represents the younger man.

And now we present the biographical sketch and portrait of the third of the distinguished triumvirate of editors *emeriti*, junior in years to the other two, although it so happened that he preceded them as editor-in-chief of the JOURNAL. In one of his characteristically delightful letters, Dr. Brush gives us the career of his life-long friend. It has been one of the compensations of the present editorship that it offered opportunity for a continuing correspondence with these three men. Dr. Brush has called attention to the richness and charm of Dr. Blumer's literary style, a quality reflected no less in his friendly letters than in his more studied productions. It is a virtue which not all scientific writers contemplatively cultivate; but the judicious will subscribe to the maxim which we may believe has been a guiding principle with Dr. Blumer in his spoken and written words—If a thing is worth saying, it is worth saying well.

Born in Britain, Blumer early became a citizen of the world, studying in England, Scotland, Germany, France, finally adventuring to the United States and completing in Philadelphia the medical training he had begun in Edinburgh.

Here he has made his home and a distinguished career. Beginning his psychiatric work 52 years ago, his was a leading influence in bringing about many of the reforms in the organization

and conduct of mental hospitals and in the treatment of patients which today we accept as matters of course. To those who like Dr. Blumer have contributed their full share in the struggle for progress against reaction it must be eminently satisfying to compare present-day methods with those in vogue when they began their labors. We owe it to Dr. Blumer's foresight, as Dr. Brush has told, that the **AMERICAN JOURNAL OF INSANITY** was acquired by the Association and made its official organ, thus entering upon a career of greatly increased usefulness which might never have been realized had this step not been taken at a crucial moment.

Dr. Blumer's major services were given to the State Hospital at Utica and to Butler Hospital. Dr. Hutchings and Dr. Ruggles, the present superintendents of those two institutions, have added their voice to that of Dr. Brush to do honor to their predecessor. We are fortunate in being able to reproduce along with Dr. Blumer's portrait a group photograph from those early hirsute days at Utica when Brush and Blumer were setting out upon their life-work which has meant so much to this Association and to the **JOURNAL**.

C. B. F.

**A WORD FROM THE PRESIDENT.—PLANS FOR THE FUTURE.**—For many years the programs offered at the annual meetings of the Association have followed hard and fast lines from which there has been little or no deviation. There are certain ancient landmarks, established by constitutional requirements, from which no departure is possible for the time being. One of these is the address delivered at every session by the President. Some of these have been subjected to very unfavorable criticism. For more or less obvious reasons he is expected to avoid topics pertaining to clinical psychiatry.

There has always been an address of welcome by the mayor of the city or the head of some municipal department representing him, and one by the governor of the state, if his presence is possible. On Tuesday evenings there are almost invariably "round table" discussions of various subjects. On Wednesday evening we have the "annual address," delivered usually by a distinguished member of the medical or some other profession. These almost invariably have to do with subjects bearing very little, if any,

relation to psychiatry. This annual address could be replaced by something else if the Association deems such a change desirable. It is always followed by the time-honored President's reception, which has often been referred to as a formality which could be dispensed with to great advantage. There is considerable question as to whether the dance following the reception should not be replaced by an entertainment of some kind better adapted to the hot summer weather.

It has often been said that there are too many evening sessions, and that a little time for rest and relaxation would be appreciated. It has been suggested that there are entirely too many scientific papers, and that those in attendance cannot maintain their interest in sessions which cover practically every morning, afternoon, and evening throughout the week. The opinion has been expressed that there should be fewer papers read, and that there should not be two sections, so that those who care to do so can listen to all of those contributing. There is no reason why material changes cannot be made in our methods of procedure if they meet with your approval. At any rate, innovations should be given careful consideration. Radical departures from our established traditions should, however, be based on a pretty general expression of opinion from the fellows and members.

Without offering any views of my own on these subjects I should like to take the liberty of requesting all who feel inclined to make suggestions relative to our programs to express themselves clearly and specifically in a communication addressed at an early date to the Chairman of the Program Committee, Dr. Samuel W. Hamilton, of the Bloomingdale Hospital, White Plains, N. Y.

JAMES V. MAY.

PROCEEDINGS.—The President in his message on plans for the future, touches upon various points which have doubtless occurred to a good many of the fellows and members of the Association, and about which there has been not a little private discussion. The time-honored procedure, in which the same events take place in the same manner and succession year after year, has the advantage and dignity of hallowed custom; but should not be so inflexible as to prevent desirable innovations. Here are matters for the members to think about, and suggestions should be transmitted to Dr. Hamilton, Chairman of the Program Committee.

REVISION OF CONSTITUTION.—The attention of the membership of the Association is particularly drawn to the draft of the proposed revision of the Constitution published in this number of the JOURNAL. Present and past officers have had these changes in mind for several years, and the Committee on Revision has given much careful thought to the matter. The present status of the Association, its expanding fields of activity, increasing responsibilities and rising standards of efficiency and of scientific work, make a revision of the Constitution highly desirable, indeed essential to satisfactory progress.

In the present draft existing sections and proposed revisions are conveniently arranged for comparison, and it is urged that they be given careful study. Comments or suggestions should be sent to Dr. Bond, Chairman of the Committee, as early as possible. Final action on the proposed revision will be taken at the 1933 meeting in Boston.

CORRECTION.—By an unfortunate accident a proof correction of the last paragraph in the comments on the Philadelphia meeting of the Association, page 174 July issue, was not made.

The paragraph should read: "This is, we believe, a wise step, one which perhaps might to the advantage of the Association have been taken earlier.

"Dr. James V. May, Superintendent of the Boston State Hospital, was elected President for 1932-33.

"The meeting in 1933 will be held in Boston, Mass., at a date to be announced later."

THE CHICAGO SOCIETY FOR PERSONALITY STUDY.—There has recently been organized in Chicago The Chicago Society for Personality Study, consisting of psychiatrists, psychologists, sociologists, educators, physiologists and others, with the object of integrating the sciences in a scientific body devoted to the study of personality in all its phases, normal and abnormal, child and adult. Its membership is limited to 100. It includes the best students of personality problems and human behavior connected with various scientific and educational institutions in and around Chicago.

The officers elected are as follows: President, Dr. Meyer Solomon, Department of Neurology, Northwestern University

Medical School; Vice-President, Prof. Ernest W. Burgess, Department of Sociology, University of Chicago; Secretary-Treasurer, Dr. Paul L. Schroeder, Director, Institute for Juvenile Research.

The organization committee included, in addition to the above three; Dr. John Favill, Department of Neurology, Rush Medical College, Prof. Robert H. Gault, Department of Psychology, Northwestern University; Prof. Arthur J. Todd, Department of Sociology, Northwestern University; and Prof. Harvey Carr, Department of Psychology, University of Chicago.

ANOTHER NARCOTIC HABIT "CURE."—A considerable publicity, mainly through the lay press, has lately been given to the claims of Professor Wilder D. Bancroft of the Chemistry Department of Cornell University, that sodium rhodanate may be regarded as a "cure" for drug addiction. Professor Bancroft maintained this thesis in an address before the International Narcotic Education Association in New York City. Not only is the drug proclaimed to be a cure for morphinism, but it is also advocated for its alleged beneficial effects in alcoholism, and in some forms of mental disease.

In view of the possible unfortunate results of such publicity the Tompkins County Medical Society appointed a committee to investigate and report upon the subject. A signed letter of this committee embodying their findings and opinions was published in the *Journal of the American Medical Association*, July 2, 1932. In this letter it is pointed out that:

In the series of experiments with drug addicts in Ithaca, no controls of any types were used. . . . Sodium rhodanate has been freely used by its proponents in numerous disease states despite the fact that the pharmacology of it is, as yet, imperfectly understood. That this free administration is not without danger is attested by the fact that one out of ten patients receiving this drug died an inexplicable death. . . . Of the three Ithaca investigators not one has had sufficient contact with cases of drug addiction to warrant credence being placed in their observations on this type of case. . . . The medical society has knowledge of more than a hundred cases of drug addiction treated with sodium rhodanate without success. The investigators concerned were unanimous in their declarations that this drug had little or no effect on the withdrawal signs and symptoms and was in no sense a "cure." Regarding the use of sodium rhodanate in alcoholism, the medical society contends that no data have been brought forward to prove any favorable influence in this condition.



The report concludes:

So far as can be determined at present, there is no magic efficacy nor convincing beneficial effect of sodium rhodanate in disturbances of nervous system colloids in various disease states and the case for the drug remains to be proved.

The United States Public Health Service has considered this matter sufficiently important to issue a special brief bulletin, in which the department calls attention to and quotes from the conclusions of the Tompkins County Medical Society through their special narcotic committee, whose report in the *Journal of the American Medical Association* has been referred to above.

Sodium rhodanate is not the first agent of "cure" which has been brought forward with great acclaim for the treatment of narcotic addiction. It will be recalled that several years ago "narcosan" was widely heralded as an infallible remedy for the opium habit. In November, 1927, the Mayor's Committee of New York City, was appointed to investigate the narcosan treatment and their findings (*Journal American Medical Association*, October 26, 1929) were that narcosan was not a specific; that withdrawal symptoms were all more severe under narcosan treatment, even endangering life in aged and infirm patients; that there was no removal of craving following narcosan treatment. The complete text of the report of the mayor's committee on treatment of drug addiction, in which many drugs were studied in addition to narcosan, appeared in the *AMERICAN JOURNAL OF PSYCHIATRY*, November, 1930.

The advertising of drug specifics for cases of narcotic habit betrays an unfortunate ignorance of the nature of these cases and of the psychologic, and too often, psychopathic background, which accounts for their development, and for the difficulty of their cure.

AGE AND ABILITY.—Dr. Walter R. Miles, in his presidential address before the American Psychological Association in its 1932 session at Cornell University, discussed the "scientifically neglected latter half of human life."

"Psychologists have exhibited great interest in the first two and a half decades of life. But this still leaves five or six decades of human adult life relatively untouched. Maturity, later maturity and senescence are still in the realm of folklore, anecdote and personal impression."



Dr. Miles reported the results of certain special tests carried out with 863 individuals ranging in age from 6 to 95, more than half being above the age of 50. His interest lay in estimating the diminution in general and special abilities in later life, with special reference to the question of employability. He noted the tendency to break-up, even sudden death, in active men following retirement; and raised the question of the justification of forced retirement at a set age, and of the reluctance of employers to engage men over 40.

Taking visual acuity as an example, and rating the peak ability of the second or third decade at 100, persons in the fourth and fifth decades scored 93, those in the sixth and seventh decades scored 76. The decline of motor abilities with age is less than is commonly believed. The attitude of industry toward the aging is "far harsher than the objective data warrant, especially if selective activity in terms of their best functions could be utilized for older workers. . . ."

"Although younger adults tend regularly to score higher in most of the measurements, it is by no means true that all the high scores belong to the young. In reaction time 25 per cent of the people over 80 years of age were as quick as the average for the total group. In intelligence approximately a quarter of the oldest subjects score, even when speed is a factor, above the general adult average.

"I am inclined to believe that, aside from the actual increase of handicaps with increasing age, the weight of the feeling of inferiority and insecurity due to the decrease in physical strength and energy is itself the most tremendous burden."

## Correspondence.

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TO THE EDITOR OF THE AMERICAN JOURNAL OF PSYCHIATRY:

*My Dear Dr. Farrar:* Some one said to me some weeks ago that in proposing to publish sketches of the three editors *emeriti* you had taken steps to form a mutual admiration society. This was not, however, in the way of criticism for I happen to know that the speaker approved your course. My personal feeling is that you have proposed among other things, to show that three men who have worked in the same general field of medical science; who have devoted some of their time to editorial work on the same periodical; who have met in conference and joined in debate; who have each passed three score and ten years of life; have demonstrated that among them has grown up mutual esteem, yea affection; mutual confidence and understanding; and, if you will, mutual admiration. None of them has reached the period of life when all its uses have become flat, stale and unprofitable; Dr. Dewey of whom I have written,\* at 86 shows the mental activity and interest in affairs of a man half his age and Dr. Blumer, of whom I propose to speak, shows at 75 no abatement of his natural mental vigor.

Your invitation to contribute to the JOURNAL something concerning my friend of more than half a century, my former associate on the staff of the state hospital at Utica and on the AMERICAN JOURNAL OF INSANITY, is accepted therefore with pleasure, though I recognize most clearly how inadequate I am to the task.

George Alder Blumer was born in Sunderland, England, May 25, 1857. His father was Dr. Luke Blumer and his mother Mary Jane (Bone) Blumer. He belongs to a medical family. Two of his brothers became physicians of whom one is deceased, while the other is the dean of the medical profession in Stafford, England, and was some time mayor of the town. Dr. George Blumer, clinical professor of medicine in Yale Medical School is a cousin.

\* Am. Jrl. Psychiat. Vol. XI, No. 2, Sept., 1931, p. 386.

Dr. Blumer's early education was obtained in Newcastle-on-Tyne. When quite young, at fifteen years of age, I believe, he was sent to a Moravian school at Neuwied-am-Rhein, Germany. Here he remained long enough to obtain a most excellent command of the German language which he retains, and which was of great advantage to him in his later studies in medicine.

From Neuwied he went to the Lycée Corneille de Rouen, France, there obtaining an equally good training in French.

In 1874-75 Blumer attended the University of Edinburgh as a medical student. His course there was interrupted in favor of cultural studies as an undergraduate, 1876-77, at the University of Durham, where in his sophomore year, he was elected president of the Union, the chief honor of the undergraduate body.

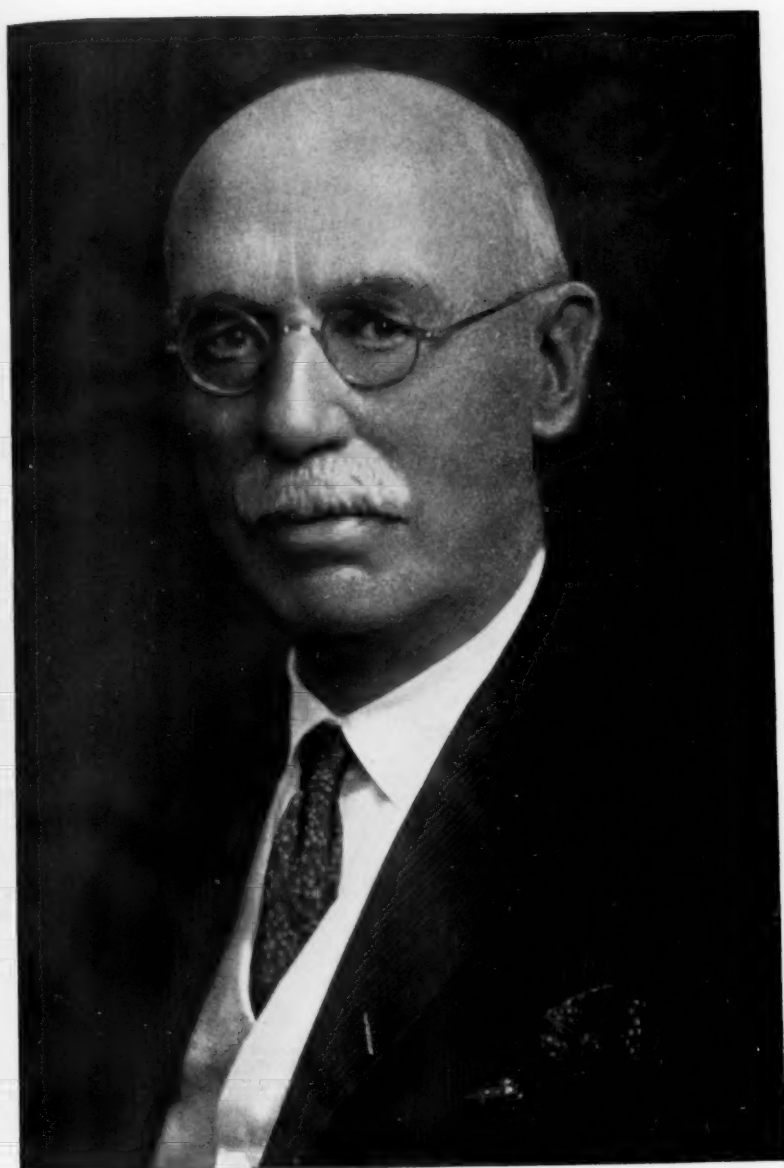
In the fall of 1877 he came in contact with an address delivered at the Centennial Exhibition in Philadelphia by the governor of Texas. The address, Blumer has told me, pictured Texas as a land flowing with milk and honey, the land of opportunity for young men. It fired the imagination of youth and he determined to go to Texas, and secretly went about his preparations.

He landed in New Orleans in November, 1877, and on his way to San Antonio met Dr. George Cupples of the latter place.

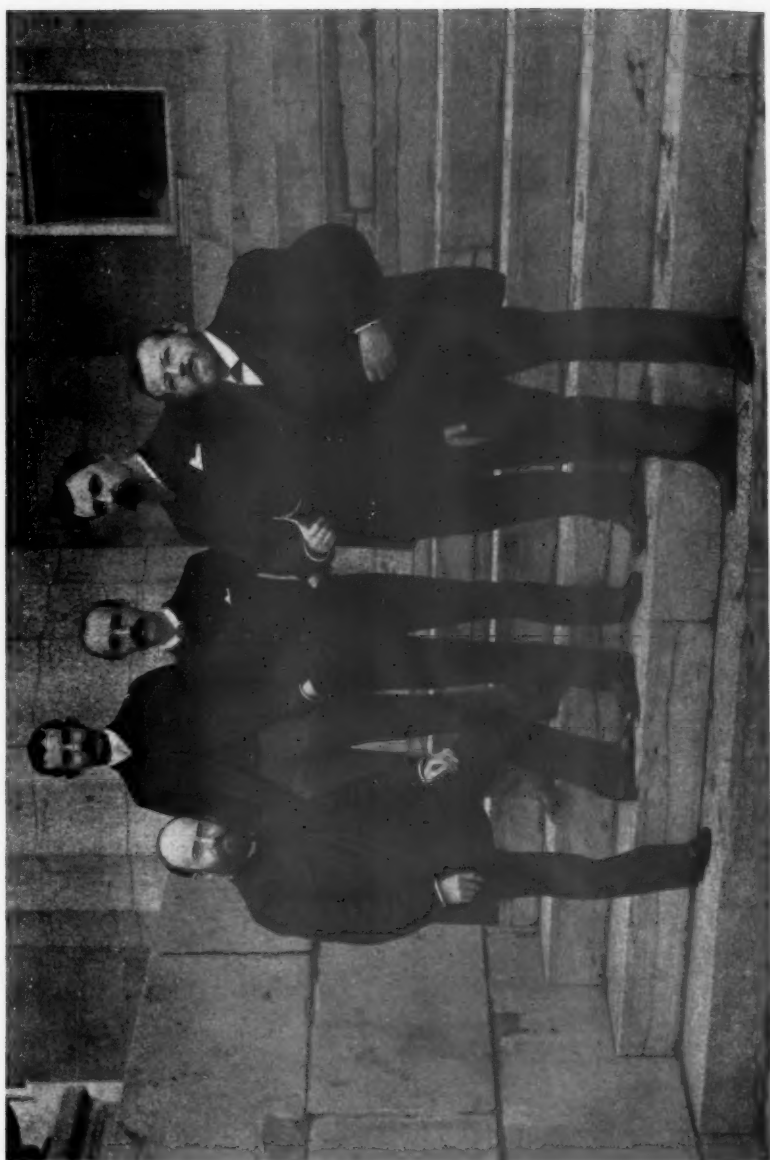
Dr. Cupples was clearly attracted to the young adventurer. He was a Scot, educated in medicine at the University of Edinburgh and in Paris, a gentleman and one of culture. He invited Blumer to call upon him in San Antonio, and soon convinced the youth of twenty of the futility of any aspirations to enter upon the commercial or agricultural life of the state. He engaged his assistance in the preparation of a statistical paper he was writing on Texas surgery and encouraged him to resume his medical studies under his preceptorship and under his roof.

In the fall of 1878 Blumer entered the University of Pennsylvania as an advanced student, receiving credit for his work at Edinburgh, and graduated "M. D." in 1879.

Upon graduation, he received an appointment as resident physician to the German Hospital, Philadelphia, now known as the Lankenau Hospital. Here he spent an active year, making in the meantime many friends among the physicians of the city. Among these were members of the staff of the Department for Mental Diseases of the Pennsylvania Hospital in West Philadelphia. Visiting this institution from time to time he conceived



Faithfully yours  
G. Alder Blumer



ASSISTANT MEDICAL STAFF, UTICA HOSPITAL, 1884.

Left to right—Edward N. Brush, Ogden Backus, G. Alder Blumer, Charles W. Pilgrim,  
Theodore Deecke (Pathologist).

the idea of entering upon psychiatric work. He saw in West Philadelphia copies of the *AMERICAN JOURNAL OF INSANITY* and felt that he would like to become connected with the institution where it was edited and published.

He put in an application for the first vacancy on the staff and was appointed; joining the staff on the 25th of June, 1880.

Dr. Blumer has described (May, 1932, *JOURNAL*) his arrival in Utica and his initiation there by the writer. He was soon to be introduced to more important work and coming as he did fresh from the wards of a general hospital where he had served under some of the leading physicians of Philadelphia; bringing with him the teaching of the ancient school at Edinburgh, the Alma Mater of many of America's most noted practitioners, and a cultivated mind alert to mark, learn and inwardly digest new experiences, he was very quickly recognized as a valuable and stimulating addition to the medical staff.

He has spoken of the work on the *JOURNAL OF INSANITY* and of our collaboration therein. I soon learned that though his senior I had much to learn from him and that the positions of teacher and neophyte were easily reversed. We worked together in reviewing books and reports of other institutions. From the latter we gathered not only many valuable hints for use in our work, but also much occasional amusement. I wonder if he recalls our hearty laugh in finding in the table of causation in the report of a far western asylum the cause ascribed to one case, "struck by another Chinaman."

Blumer's first original contribution to the *JOURNAL* was to No. 1, Vol. XXXIX, July, 1882, "A Case of Perverted Sexual Instinct."

Dr. Gray, always anxious that the members of his medical family should make a favorable impression in general society, occasionally indulged in a little monitory advice. Blumer, although always able to hold his own in any company, was, as a new-comer, naturally reserved and not over-talkative in the presence of those whom he was meeting, perhaps for the first time, and on one occasion I recall Dr. Gray told the latest acquisition to the staff that he must "speak up."

He soon found the admonition unnecessary and those who have watched Blumer's career realize how frequently and to what good effect he has "spoken up."

Among the business men of the city, as well as in the professions of divinity, law and medicine, there were many men of broad culture, of light and leading. A group of these met at occasional intervals to engage in discussion and comment. Dr. Blumer was, I believe, the youngest man ever invited to join this coterie.

Like Shakespeare's Ann, he "hath a way." His relations with his associates on the staff were of the most cordial kind; no member was more often quoted, none more highly esteemed.

When, therefore, in 1883 he decided to return to Edinburgh for a post graduate course, giving us no assurance of his return to America, there was a feeling of consternation. I do not now recall who accompanied him to the railroad station on the night of his departure; but, when among us, it was decided that some one must go, no one asked for the assignment, and when the one who did go returned I vividly recall his saying to the rest of us assembled in the library, "Well, he's gone," and then turning on his heel, leaving a silent group, which soon broke up. He did return from Edinburgh bringing with him the L. R. C. P. and L. R. C. S. of that ancient school. He resumed his position as second assistant on the staff and again entered into the life of the hospital and of the city.

His advancement from the position of fourth assistant in 1880 to second had been rapid and in December, 1884, he succeeded me as senior or first assistant on my departure for Philadelphia.

There were others who coveted the position, one a medical superintendent attempted to pull political wires to obtain it, but Dr. Gray was adamant. He proposed to choose his own staff, and his nomination of Blumer for the post was at once confirmed by the managers.

At once his work, and in a large measure, his responsibilities were increased. Dr. Gray after the attempted assassination in March, 1882, practically ceased all editorial work, and the conduct of the JOURNAL fell upon Blumer's shoulders, with Doctors Pilgrim's and Wagner's and subsequently Dr. Mabon's assistance. Not only that, but, in 1885, Dr. Gray's physical vigor had become visibly impaired. In February, 1886, the managers granted him a leave of absence and from that time until December, 1886, when Dr. Blumer became medical superintendent following Dr. Gray's



death November 29, 1886, he was virtually superintendent of the asylum.

I am neither writing nor proposing to write a biography of Dr. Blumer. May the time be long deferred when anything of the sort is required unless he will follow the suggestion of the late Mr. Rathbone Gardner, president of the trustees of Butler Hospital in the annual report of the hospital for the year 1921.\*

It is hoped that Dr. Blumer has taken Mr. Gardner's suggestion to heart and that he will, if he has not already undertaken the task, give us an account not only of a life which has been full of service, but of the men with whom he has come in contact, and of the changes which have taken place not only in the conduct of hospitals but in the views of their relation to the great public which they serve; to the advancement of the science and art of medicine, and of the important additions to psychiatric knowledge in the more than half a century which has passed since he first stepped under the noble portico of the Utica Hospital.

While not writing a biography a certain amount of detail as to Dr. Blumer's career has been found essential to my purpose, Mr. Editor, and is, I conceive, agreeable to your wishes.

Once in charge at Utica, Blumer took early occasion to announce that henceforth the doctrine of non-restraint was to prevail in the hospital, and to remove from the wards all instruments of restraint. Early in his career as medical superintendent he made an editorial plea in the *JOURNAL* for a change of name for institutions for the treatment of mental disorders from lunatic asylum, asylum for the insane, and like appellations of unpleasant connotation. The suggestion fell upon fertile soil and soon took root, and the old names are now seldom found. There were already a few institutions for mental disorders called hospitals. In the last list of fellows and members of the American Psychiatric Association of the hospitals listed in the United States and its possessions and in British America, I find but eight in which the

\* Writing of Dr. Blumer and the possible activities in his retirement from the regular duties of a superintendent, Mr. Gardner says: "There being no competent Boswell apparent, no man has better excuse than he for writing an autobiography. If he will avail himself of the opportunities in this direction which we have given him, the sacrifice of Butler Hospital will have been fully justified."

word insane occurs in the official title of the hospital and of these the title reads either hospital for the insane, or insane hospital; the common term is state hospital.

With the abolition of restraint Blumer's attention naturally turned to increased means of employment and diversion for patients. He established farm colonies which have been a model followed by other institutions. Shops were opened for knitting, spinning, weaving, shoemaking, brush making, etc., and a coffee and spice roasting, mixing and grinding establishment was put into operation where all the coffee and spices used in the entire state hospital service were prepared.

In the printing shop the JOURNAL OF INSANITY was printed; and the translation of the Manual of Mental Medicine by Régis was set up, printed and bound there in 1894. This shop has grown until it now does practically all the printing for the state hospital system.

The life of the new superintendent at Utica was not always, by any means, a pleasant one. A bureaucratic and dictatorial State Commission of Lunacy endeavored to establish a state system of centralized control under which every superintendent in the state hospital system should follow its slightest behest. All initiative was, as far as possible, wiped out; superintendents were practically made clerks of the commission; a commission originally formed for the purposes of inspection and supervision; something to stand between the public and the hospitals; to inform the public as to their conduct; to right wrongs and correct abuses and at the same time protect hospital officials from unjust charges and malicious persecution; proposed to be at once sponsor for a system as well as the judge thereof.

Many things which had preceded its time, of which in the main its members were ignorant; brought about under conditions of which they had no knowledge, because of no experience, were called by the commission in one of its early reports, "disastrous," "unfortunate," "inhumane," "the result of unenlightened selfishness."

Nothing daunted by threats, unperturbed by secret attempts to render void his election to the superintendency, Blumer proceeded along the course he had elected to pursue, supported by his Board of Managers as well as by the public sentiment of the community.

Dr. Blumer, in his address as president of The American Medico-Psychological Association in 1903, took occasion to outline the condition of affairs brought about since 1890 in the N. Y. State Hospital administration and to call attention to certain very serious dangers which confronted the state hospital system, because of recent legislative acts and the unfortunate policy, to put it mildly, of the governor then in office.

No one could hear his ringing words without a lively sense of the difficulties which had for some time confronted hospital superintendents, and without, in the face of his revelations, echoing his wish that "once more the New York service shall have been made fit for the gentlemen who compose it."

Happily that time soon came.

The AMERICAN JOURNAL OF INSANITY had been taken over by the managers of the Utica institution on the death of Dr. Brigham. The board assumed the responsibility for its publication under the editorship of the members of the medical staff who gave ungrudgingly their service in spare time, without suggestion or hope of reward. It was in all essentials hospital property. The commission to which I have referred asked that it be turned over to it as its organ, and when this request was refused there were covert threats to seize it.

Upon Dr. Blumer's suggestion and advice it was sold by the managers to the American Medico-Psychological Association in 1894 and has since then been the property and organ of that Association, now the American Psychiatric Association.

During Dr. Blumer's editorship, 1886 to 1894, many improvements were wrought in the periodical; were time and space available I should like to quote from some of his editorials, as well as from some of the annual reports of the hospital written by him.

He handled a trenchant pen, and used a large, interesting and attractive vocabulary. One physician said to me: "I read his reports for I like what he says; but above all I admire the way he says it." Dr. John Brown of Edinburgh said of Dr. Adams, the translator of Hippocrates and other Greek medical classics, "He was not a man of vocables only but a man of action," and this also may be said of Dr. Blumer.

He sought peace and ensued it, but he could on occasion show a righteous indignation. One may read with pleasure an editorial in the AMERICAN JOURNAL OF INSANITY, Vol. LV, April, 1900,

p. 723, in which in choice terms he severely condemns Governor Theodore Roosevelt for his failure to reappoint Dr. Truman J. Backus to the Board of Managers of the Long Island State Hospital, after a promise to do so, following the unanimous request of the fellow members of the board. He is never at a loss for a classical quotation. Once he applied one to me in an amusing manner. I had asked him to undertake a task for the JOURNAL; in declining the assignment he wrote, "We were told that all Gaul was divided into three parts; yours apparently was never divided."

On May 1, 1899, Dr. William A. Gorton who had been medical superintendent of Butler Hospital since May, 1888, died, and in due time the trustees began a search for a successor. In their annual report for 1921, after reporting Dr. Blumer's resignation as physician-in-chief and superintendent of Butler Hospital, the trustees narrate how they sought the advice of the "best informed alienists" and canvassed the whole list of available men; how a committee visited the Utica State Hospital, brought Dr. Blumer to Providence to show him the possibilities for usefulness offered by the Butler Hospital.

On July 7, 1899, Mr. William Goddard, president of the board and chairman of the committee, made its report.

In the words of Mr. Rathbone Gardner in this report, "Mr. Goddard described Dr. Blumer and his work and set out the qualifications which fitted him to be the head of Butler Hospital in language as felicitous and as carefully chosen as though he were delivering a Phi Beta Kappa oration." After such an introduction Dr. Blumer was at once and unanimously elected to the vacant post.

In his work at Butler, Dr. Blumer has exhibited the same characteristics which made him successful at Utica. He, in a large way, remodeled the institution. He found restraining apparatus and "cells" for the violent, which Mr. Gardner says "were never used after Dr. Blumer came."

Robert Louis Stevenson, at the conclusion of his sketch of John Knox, says:

Most of us even if by great strength and the dignity of gray hairs, we retain some degree of public respect in the latter days of our existence, will find a falling away of friends and a solitude making itself around us day by day. . . . It is only with a few rare natures that friendship is added

to friendship, love to love, and the man keeps growing richer in affection—richer, I mean, as a bank grows richer, both giving and receiving more—after his head is white and his back weary.

To those of us who know Dr. Blumer; who have enjoyed personal or epistolary contact with him; who have read what he has written; who have had some inkling of his varied activities outside as well as within the scope of professional work; these words will seem particularly appropriate. He has added "friendship to friendship, love to love."

On June 21, 1921, a new building erected for laboratory study and research was dedicated at the Utica State Hospital. The managers had named this building The George Alder Blumer Laboratory.

A bronze tablet on the laboratory wall states that it commemorates the services of Dr. Blumer, "Physician, Editor, Author, one-time physician and superintendent of the Utica State Hospital, whose wisdom, foresight and humanity contributed to the advancement of his profession, to the sum of human happiness and to the dignity of life."

Many of the citizens of Utica, a large number of medical men, several of whom had come from the annual meeting of the American Psychiatric Association in Boston, to pay honor to their fellow member, and numerous past and present employees of the hospital were present at the exercises.

Papers of a scientific nature were read at a meeting in the morning by Drs. Adolf Meyer, James V. May, George H. Kirby, J. Montgomery Mosher, John R. Ross and Horatio M. Pollock. After lunch the assembly gathered at the laboratory building where under the chairmanship of Mr. George E. Dunham, president of the Board of Managers addresses were made by Dr. Charles W. Pilgrim, president of the N. Y. State Hospital Commission, Dr. Charles G. Wagner and the writer, all of whom had been associated with Dr. Blumer on the Utica staff, the Hon. P. J. C. De Angelis, a member of the hospital board when Dr. Blumer was appointed superintendent at Utica, and Professor Walter G. Everett of Brown University, representing the trustees of the Butler Hospital.

Dr. H. W. Mitchell, superintendent of the Warren, Pa., State Hospital, chairman of a delegation appointed by the American Psychiatric Association to attend the dedicatory exercises, pre-

sented resolutions unanimously adopted by the association in appreciation of the action of the managers and superintendent of the Utica Hospital in dedicating the laboratory in honor of Dr. Blumer.

On July 7, 1921, 22 years after his election as physician-in-chief and superintendent of Butler, Dr. Blumer presented his resignation to the trustees asking to be relieved on December 31. He had in his report to the trustees for the year ending December 31, 1919, made what the trustees called an "initiatory swan song," presenting a "situation" which seemed "to call for watchful waiting." The board, the report says, recognized "much more strongly than his modesty will permit him to do, his claims upon the gratitude and consideration of Butler Hospital" and "would rejoice, as would the community at large, to witness the gambols in which he would indulge, unharnessed and untethered."

These "gambols" have been in the way of work in diversified fields. Since his retirement he has been among other things a director, and president of the Providence Athenæum; a trustee and until recently secretary of the Rhode Island School of Design; a trustee and president for two years of the Rhode Island Historical Society; a member of the Board of Visitors of Brown University, and a director of the Rhode Island Society for Mental Hygiene. He has also been chairman of the Rhode Island Division of the Association against the Prohibition Amendment, and a director of the national body. He has contributed much, in the way of sketches of medical men, to the Dictionary of American Biography. He not long since wrote to her who in a measure supervises my own activities that she must curb them. In the face of the above list I am tempted to refer to the parable of the mote and the beam.

In addition to the M. D. of the University of Pennsylvania, and the L. R. C. P. and L. R. C. S. of Edinburgh, Dr. Blumer has received from Brown University the honorary degree of Litt. D. (1905) and from Hamilton College that of L. H. D. (1921). In 1930 he was elected by Brown University honorary member of Phi Beta Kappa.

On the fifth of July, 1926, upon the invitation of the Right Reverend James De Wolf Perry, Jr., D. D., Bishop of Rhode Island, president of the Society, Dr. Blumer delivered the annual



address before the Society of the Cincinnati in the State of Rhode Island and Providence Plantations, at the Colonial State House, Newport. He chose for his subject, "Shall the Ancient Grudge be Starved?" In this address, written in his characteristic style, he makes an eloquent plea for the starvation of the ancient grudge, held in both England and America, dating back to colonial days, the result of ignorance, misunderstanding and misrepresentation, and the building up of a concord based upon mutual respect and understanding; upon common aspirations and a common origin and language, to work for the peace of the civilized world.

I have made in all this but casual reference to our long and intimate friendship. Blumer himself has touched upon that in a late number of the JOURNAL. To neither of us, I think, does it seem a matter for public discussion.

May I say of him in conclusion, and say it from the heart, what Pope said of Addison:

"In action faithful and in honor clear;  
Who broke no promise, served no private end;  
Who gained no title and who lost no friend;  
Ennobled by himself by all approved."

I am, very sincerely yours,

EDWARD N. BRUSH.

PROVIDENCE, R. I., August 18, 1932.

EDITOR, AMERICAN JOURNAL OF PSYCHIATRY:

*Dear Dr. Farrar:* The AMERICAN JOURNAL OF PSYCHIATRY and the practice of psychiatry itself has, indeed, been favored by numbering among its leaders some outstanding physicians who have possessed unusual literary ability. Those of us who have read hospital reports have always been charmed, intrigued and broadened by reports of the Utica State Hospital and Butler Hospital written by Doctor Blumer over a period of many years.

During a long professional career, Dr. Blumer has always maintained a sincere interest in many cultural activities, and his ability to reach the period of retirement and to give up active professional work was achieved in a manner that should be a lesson to us all. Dr. Blumer has continued active in community service, has charmed his multitude of friends with his delightful correspondence, and has continued and developed a wide variety of cultural interests. We all wish that he might write a monograph on the



art of passing three score years and ten gracefully and continuing unabated a delightful philosophy of life.

Very sincerely yours,

ARTHUR RUGGLES.

UTICA, N. Y., August 22, 1932.

EDITOR, AMERICAN JOURNAL OF PSYCHIATRY:

*Dear Dr. Farrar:* It is pleasing news that Dr. Blumer's friends have planned to record their appreciation of him in a forthcoming number of the JOURNAL. Perhaps a few lines from his old home will be thought appropriate. It was here that he became the superintendent of the State Lunatic Asylum and *ex officio* editor of the JOURNAL at the early age of 29. The battles he waged and the victories he won for progress and enlightenment have become part of a larger history than Utica, and mine is not the pen to do them justice.

I well remember the occasion when it can be said I came to know him, though previously we had met casually. It was on a cold winter morning, hardly later than dawn, in the year 1897, when he boarded a train for Albany and spying me, a passenger, sat down beside me. Surely one who can be spontaneous, witty and altogether delightful at that hour of the day has within him well springs of friendliness beyond the average. It will amuse him to be reminded of one of the topics of that early morning conversation. In his inimitable style he told me of an annual report of the superintendent of a certain state asylum, extracted in an early number of the JOURNAL, a large part of which was devoted to a description couched in grandiloquent bombast of the view to be had from the cupola of his institution. To my delight he quoted passages from the long report, which is just an illustration of his retentive memory and ready appreciation of humor wherever perceived.

To me, as with many others, Dr. Blumer has always been an inspiration and when I was invited to occupy the place that once had been his, I felt as Elisha of old must have felt when the mantle of the departing prophet was dropped for him.

May he live long to enjoy the youth that still is his; to enjoy his friends, his books and to wage more battles for causes that he deems worthy of his lance.

Very truly yours,

RICHARD H. HUTCHINGS, M. D.

## Association and Hospital Notes and News.

### REVISION OF THE CONSTITUTION.

At the annual meeting in Philadelphia, the Committee on Revision of the Constitution gave notice of proposed changes in the constitution. These proposed changes are herewith published as a notice to all members of the Association, the final revision to be adopted in Boston in 1933.

In urging more rigid standards for membership, the president calls attention to the action of the State Medical Society of New Jersey in making membership in the American Psychiatric Association a qualification for obtaining a certificate as specialist in psychiatry (*J. A. M. A.*, July, 1932).

Members of the Association desiring to comment on these proposed changes should send their comments to the Chairman of the Committee on Revision of the Constitution, Dr. Earl D. Bond, 111 N. 49th Street, Philadelphia, Pa.

Material in the present constitution is printed within brackets. The proposed new constitution is printed in italics.

### [AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION. CONSTITUTION.]

### CONSTITUTION OF THE AMERICAN PSYCHIATRIC ASSOCIATION.

#### [ARTICLE I.]

[This organization shall be known as The American Psychiatric Association and is continuous with the organization known from 1844 to 1892 as The Association of Medical Superintendents of American Institutions for the Insane and from 1892 to 1921 as The American Medico-Psychological Association.]

#### ARTICLE I.

*NAME.*—This corporation founded in 1844 as The Association of Medical Superintendents of American Institutions for the In-

sane, known from 1892 to 1921 as *The American Medico-Psychological Association* and since 1921 as *The American Psychiatric Association*, is hereby continued under the last designation.

#### [ARTICLE II.]

[The object of this Association shall be the study of all subjects pertaining to mental disease and defects, including the care, treatment and promotion of the best interests of the insane, epileptic, feeble-minded and allied classes.]

#### ARTICLE II.

*OBJECTS.*—The objects of this Association shall be—(A) to further the study of subjects pertaining to the nature, treatment and prevention of mental disorders. (B) to further the interests, the maintenance, and the advancement of standards of hospitals for mental disorders, of out-patient clinics and of all other agencies concerned with the social and legal aspects of these disorders. (C) to further psychiatric education and research. (D) and to apply psychiatric knowledge to other branches of medicine, to other sciences and to the public welfare.

#### [ARTICLE III.]

[There shall be five classes of members: (1) Fellows, who shall be physicians, residents in the United States or British America, especially interested in subjects pertaining to mental disease and defect; (2) Members; (3) Life members; (4) Honorary members; (5) Corresponding members.]

#### ARTICLE III.

*MEMBERSHIP.*—Section I. There shall be six classes of members: Fellows, Members, Associate members, Life members, Honorary members, Corresponding members.

Section II. All classes of membership except Honorary and Corresponding members shall be residents of the United States or British America at the time of their election.

Section III. An Examining Board of five Fellows or Life members shall be appointed by the President and approved by the Coun-

*cil. One member of this Board shall retire each year and be ineligible for reappointment. It shall be the duty of this Board to make a report and recommendation to the Council on every application for every class of membership.*

*It shall also be the duty of this Board immediately after its organization and from time to time afterward to submit to the Council plans for the procedures by which it proposes to pass upon the fitness of new applicants for membership and of present members of the Association.*

*Section IV. Fellows hereafter shall be chosen from members of not less than one year's standing who have been engaged exclusively in the practise of psychiatry for at least six years.*

*The Council by unanimous vote and on recommendation of the Examining Board may recommend as Fellows, candidates from outside of the Association who have shown exceptional qualifications in psychiatry.*

*Section V. Members hereafter shall be chosen from physicians who have been engaged exclusively in the practise of psychiatry for at least three years.*

*Members shall be recommended to Fellowship as it becomes apparent that they deserve this recognition.*

*Section VI. Associate members shall be of two classes: A—the first, physicians who have had at least one year's practise in a mental hospital. B—the second chosen from physicians who are experienced or distinguished in branches of science pertaining to psychiatry.*

*Section VII. Life members shall be those who have maintained themselves in good standing as Fellows (or formerly as active members) for thirty consecutive years.*

*Section VIII. Honorary members shall be those who have distinguished themselves by attainments in psychiatry or related sciences or who have rendered signal service in philanthropic efforts to promote the interests of psychiatry and mental hygiene.*

*Section IX. Corresponding members shall be those who are qualified for Fellowship but who are not residents of the United States or British America.*

## [ARTICLE IV.]

[The officers of the Association shall be a President, Vice-President, Secretary—who shall also be the Treasurer—three auditors, and twelve Fellows or life members of the Association to be called Councillors; these officers together shall constitute a body which shall be known as the Council. The retiring president shall be nominated for Councillor for three years and other ex-presidents shall be ex-officio Councillors without power to vote.]

## ARTICLE IV.

*OFFICERS.*—The officers of the Association shall be a President, President-Elect, Vice-President, Honorary Vice-Presidents, a Secretary and a Treasurer whose duties may be combined, and a Council to include the above officers, and nine Fellows or Life members, to include the retiring President.

*Honorary Vice-Presidents shall be those Fellows elected Chairmen of sections of the Association.*

*Immediate Past-Presidents after their service in the Council shall thereafter be ex-officio members of the Council without the right to vote.*

*There shall be three Auditors, one of whom shall retire each year.*

## [ARTICLE V.]

[The Fellows of the Association shall include the active members in the official list published in 1921 of members of the American Medico-Psychological Association.]

[Physicians who by their professional work or published writings have shown a special interest in the care and welfare of the insane and allied classes are eligible to Fellowship.]

[The class, Members, shall include the names of Associate members published in the above mentioned list.]

[Those eligible for membership in this class are regularly appointed assistant physicians of institutions for the insane that are regarded to be properly such by the Council and such other physicians as are deemed suitable for membership by the Council. After three years a Member may become a Fellow by making applica-

tion in writing to the Council and upon its approval being elected in the manner hereinafter prescribed.]

[Life members shall be such Fellows as shall have been Fellows or Active members of the Association for a period of thirty (30) consecutive years.]

[Among Honorary members shall be included the names of such published in the above mentioned list. Physicians and others who have distinguished themselves by attainments in branches of science pertaining to mental disease and defect, or who have rendered signal service in philanthropic efforts to promote the interests of persons subject thereto, shall be eligible for Honorary membership.]

[Corresponding members shall be those hereafter elected as such.]

[Physicians not residents of the United States or British America, who are actively engaged in the treatment of mental disease or defect may be elected Corresponding members.]

[The above mentioned lists for 1921 shall be corrected by the Council as may be necessary to carry out the intention of the Constitution as to continuance of existing membership.]

[Every candidate for admission to the Association hereafter as a Fellow shall be proposed to the Council, in writing, in an application addressed to the President, at any annual meeting preceding the one at which the election is held; provided that any such candidate, whose name has been properly presented to the Council at its first session Monday evening and to the Association at its first business session on Tuesday may on unanimous recommendation of the Council, if no objection be made, be elected the following Wednesday or Thursday.]

[Members, Honorary and Corresponding members, may be elected after approval by the Council of applications, which shall be made in writing, and addressed to the President, at least two months prior to the meeting of the Association.]

[Every application of whatever class must include a statement of the candidate's name and residence, professional qualifications, any appointments then or formerly held, and certification that he is a fit and proper person for Fellowship or Membership.]

[In the case of a candidate for Fellowship or Membership, the application shall be signed by three Fellows or life members of

the Association; and the proposal for an Honorary member or Corresponding member by six.]

[The names of all candidates approved by majority vote of members of the Council present at its annual meeting shall be presented on a written or printed ballot to the Association at its concurrent annual meeting, at least one session previous to that at which the election is made, which shall be by ballot at a regular session and require a majority vote of the Fellows or Life members present and voting.]

#### ARTICLE V.

*VOTING PRIVILEGES.*—*Fellows and Life members only shall be entitled to vote at any meeting, or be eligible to office in the Association. Life members, Honorary members, and Corresponding members shall be exempt from the payment of annual dues to the Association.*

#### [ARTICLE VI.]

[Fellows and Life members only shall be entitled to vote at any meeting or be eligible to office in the Association. Life members, Honorary members and Corresponding members shall be exempt from the payment of annual dues to the Association.]

#### ARTICLE VI.

*ELECTION OF OFFICERS.*—*Section I. The officers and three members of the Council and one Auditor shall be elected at each annual meeting. Nominations shall be made to the Association in the order of business at the first session of the second day of the annual meeting by a committee appointed for that purpose by the President during the first month of his incumbency. Elections shall take place immediately. The nominating committee shall consist of five members appointed from the Association and two from the Council. It will send out its ballot in the Journal or otherwise, to every member of the Association, at least one month before the annual meeting. Other nominations may be made from the floor.*

*Section II. The President, President-Elect, Vice-President, Honorary Vice-Presidents and Secretary and Treasurer shall hold*



office for one year. Councillors and Auditors shall serve three years. The President, President-Elect and the four retiring Councillors are ineligible for re-election to their respective offices for one year immediately following their retirement. The President, President-Elect, Vice-President, Secretary and Treasurer, shall enter upon office at the close of business at the annual meeting at which they are elected. Other officers shall enter upon their duties immediately after their election. All officers shall serve until their successors are elected, and qualified.

Section III. A majority of the members of the Council shall constitute a quorum.

#### [ARTICLE VII.]

[Any Fellow or member of the Association may withdraw from it on signifying his desire to do so in writing to the Secretary: *Provided*, That he shall have paid all dues to the Association. Any Fellow or member who shall fail for three successive years to pay dues after special notice by the Treasurer shall be regarded as having resigned membership, unless such dues are remitted by the Council for good and sufficient reasons.]

[The name of any Fellow or member declared unfit for membership by two-thirds vote of the members of the Council present at an annual meeting of that body shall be presented by the Council to the Association from which he shall be dismissed if it be so voted by a number not less than two-thirds of those present at the annual meeting, registered and voting.]

#### ARTICLE VII.

*POWERS.*—The President shall preside at the annual and special meetings of the Association or Council. In his absence at any time the Vice-President shall act in his place. The President shall appoint committees of the Association.

The President-Elect shall assume the office of President at the close of the annual meeting held one year after his election.

The Secretary shall keep the records of the Association and perform all the duties that may be prescribed for him by the Council. The Treasurer, under the Council, shall receive and disburse and duly account for, all sums of money belonging to the Association;

he shall submit a financial statement each year to the Council at its annual meeting; he shall be placed under bond to an amount which the Council each year directs.

The Auditors shall examine each annual financial statement of the Treasurer and arrange for its audit by paid accountants. The Auditors will propose and the Council will name the depositories in which the Treasurer shall keep the funds of the Association. The Auditors will act as the Financial Committee of the Council and their recommendations and actions must have its approval.

The Council shall control the funds in the possession of the Association. It shall publish a Journal and print annually the proceedings of the meetings. It shall appoint the editor of the *American Journal of Psychiatry*. It is empowered to appoint Committees from its own membership to expend money for special scientific investigations in matters pertaining to the objects and business of the Association, to publish reports of such investigations, to adopt a budget for current expenses of the Treasurer and Committees for the ensuing year, and to apply the income of special funds to the purposes for which they were intended.

The Council shall elect an executive committee to consist of the President, President-Elect and Secretary-Treasurer with two other of its members which shall have the powers of the Council (at such times as matters important to the Association must be decided and it is considered unnecessary to call the Council together) between meetings of the Council.

The Executive Committee derives all its powers from the Council and the Council derives all its powers from the Association.

#### [ARTICLE VIII.]

[The Officers and Councillors shall be elected at each annual meeting. They shall be nominated to the Association on the second day of the annual meeting in the order of business of the first session of that day, by a committee appointed for that purpose by the President during the first day's session; and the election shall take place immediately. The election shall be made as the meeting may determine, and the person who shall have received

the highest number of votes shall be declared elected to the office for which he has been nominated.]

[The President, Vice-President and Secretary-Treasurer, shall hold office for one year or until the beginning of the term for which their successors are elected. One Auditor shall be elected annually for a term of three years. The Secretary-Treasurer and the Auditor whose term expires at any annual election are eligible for re-election. Four Councillors shall be elected each year to hold office three years, or until their successors are elected. The President, Vice-President, and the four retiring Councillors are ineligible for re-election to their respective offices for one year immediately following their retirement. All the officers and Councillors shall enter upon their duties immediately after their election, excepting the President and Vice-President and Secretary-Treasurer. When any vacancies occur in any of the offices of the Association, they shall be filled by the Council until the next annual meeting.]

[A quorum of the Council shall be formed by six members thereof; and of the Association by twenty Fellows or Life members.]

#### ARTICLE VIII.

*AMENDMENTS.*—Amendments to the Constitution shall be considered at the first session of the second day of any annual meeting and be adopted by a two-thirds vote of all Fellows or Life members present and voting: *Provided, That notice of proposed amendments has been given in writing at the annual meeting preceding that at which the amendments are submitted for action. It shall be the duty of the Secretary to send to every member, in the Journal or otherwise, at least three months previous to the voting upon an amendment, a copy of its provisions.*

*Amendments to the By-Laws shall also be considered at the first session of the second day of any annual meeting and may be adopted by a two-thirds vote of all the Fellows or Life members present and voting: Provided, That notice of proposed amendments shall have been given to the Secretary and by him published in the Journal or otherwise, at least three months previous to the*

*annual meeting at which they are to be considered, and further Provided, That these amendments have been considered at an appropriate meeting of the Council.*

[ARTICLE IX.]

[The President and Vice-President and Secretary-Treasurer for the year shall enter on their duties at the close of the business of the annual meeting at which they are elected. The President shall prepare an inaugural address to be delivered at the opening session of the next meeting. He shall preside at the annual or special meetings of the Association or Council. In his absence at any time, the Vice-President shall act in his place.]

[The Secretary-Treasurer shall keep the records of the Association and perform all the duties usually pertaining to that office, and such other duties as may be prescribed for him by the Council; and under the same authority he shall receive and disburse and duly account for all sums of money belonging to the Association. He shall keep accurate accounts and vouchers of all receipts and payments on behalf of the Association, and of all invested funds, with the income and disposition thereof, that may be placed in his keeping, and shall submit these accounts, with a financial report for the preceding year, to the Council at its annual meeting. Each annual statement shall be examined by the Auditors, who shall prepare and present at each annual meeting of the Association a report showing its financial condition. The Council shall have charge of any funds in the possession of the Association, and these shall be deposited or invested under its direction and control. The Council shall keep a careful record of its proceedings, and make an annual report to the Association of matters of general interest. The Council shall also print annually the proceedings of the meetings of the Association and the reports of the Treasurer and Auditors.]

[The Council is empowered to manage all the affairs of the Association, subject to the Constitution and By-Laws; to appoint committees from the membership of the Association; to expend money out of its surplus funds for special scientific investigations in matters pertaining to the objects of the Association, and to publish reports of such investigations; and to apply the income

of special funds, at its discretion, to the purposes for which they were intended. The Council may also engage in the regular publication of reports, papers, transactions, and other matters, in an annual volume, or in a journal, in such manner and at such times as the Council may determine, with the approval of the Association.]

#### [ARTICLE X.]

[Amendments to the Constitution and By-Laws shall be considered at the first session of the second day of any annual meeting, and may be made by a two-thirds vote of all the Fellows or Life members present and voting: *Provided*, That notice of proposed amendments has been given in writing at the annual meeting preceding that at which the amendments are submitted for action. It shall be the duty of the Secretary to send to every member at least three months previous to any annual meeting a copy of any proposed amendment.]

#### [BY-LAWS.]

#### [ARTICLE I.]

[The meetings of the Association shall be held annually. The time and place of each meeting shall be named by the Council, and reported to the Association for its action at the preceding meeting. Each annual meeting shall be called by printed announcements sent to each Fellow or member at least three months previous to the meeting.]

[The Council shall hold an annual meeting concurrent with the annual meeting of the Association; and the Council shall hold as many sessions and at such times as the business of the Association may require.]

[Special meetings of the Council may be called by the order of the Council. The President shall have authority at any time, at his own discretion, to instruct the Secretary to call a special meeting of the Council; and he shall be required to do so upon a request signed by six members of the Council. Such special meetings shall be called by giving at least four weeks' written notice.]

## BY-LAWS.

## ARTICLE I.

*The meetings of the Association shall be held annually, each meeting to extend over at least three days. The time and place of each meeting shall be named by the Council and reported to the Association for action at the annual meeting preceding. Each annual meeting shall be called by printed announcements sent to each member on its rolls at least three months previous to the meeting, and by publication in the Journal.*

*On the first day the names of all those unanimously recommended by the Council for Fellowship after approval of the Board of Examiners, shall be presented to the Association.*

*On the second day election of officers shall be held and amendments to the Constitution and By-Laws shall be considered.*

*On the third day elections to the different classes of membership in the Association shall be held. The lists of candidates submitted shall have been passed by the Examining Board and the Council. Before the close of the final session the President, the President-Elect, the Vice-President, and the Secretary-Treasurer shall be inducted to office.*

*The Council shall hold an annual meeting concurrent with the annual meeting of the Association; and shall hold as many sessions and at such times as the business of the Association may require.*

*The President shall have authority at any time, at his own discretion, to instruct the Secretary to call a special meeting of the Council; and he shall be required to do so upon a request signed by six members of the Council. Such special meetings shall be called by giving at least two weeks' written notice.*

## [ARTICLE II.]

[Each and every Fellow and Member shall pay to the Treasurer such annual dues and assessments as shall be determined by the Council at its annual meeting.]

## ARTICLE II.

*Each member shall pay to the Treasurer such annual dues and assessments as shall be determined by the Council at its annual meeting.*

## [ARTICLE III.]

[The Council shall make arrangements for the meetings of the Association and appoint and define the functions of such auxiliary committees from its own body, and from the membership of the Association as may be necessary.]

## ARTICLE III.

*Any member of the Association may withdraw by signifying his desire to do so in writing to the Secretary: Provided, That he shall have paid all dues to the Association. Any member who shall fail for three successive years to pay dues after special notice by the Treasurer shall be regarded as having resigned membership, unless such dues are remitted by the Council for good and sufficient reasons.*

*The name of any member declared unfit for membership by two-thirds vote of the members of the Council present at an annual meeting of that body, shall be presented by the Council to the Association, from which he shall be dismissed if it be so voted by a number not less than two-thirds of those present at the annual meeting, registered and voting.*

[CONSTITUTIONAL AMENDMENTS TO BY-LAWS  
ADOPTED JUNE, 1927.]

## [ARTICLE IV.]

[When another national society with interests similar to those of this Association shall express a wish for an organic union and when this union shall be acceptable to this Association the following plan shall be adopted:

1. A section of The American Psychiatric Association shall be established and appropriately named.
2. The medical members of the incoming society who are in good standing and so desire shall become members or Fellows of The American Psychiatric Association.
3. The lay members of the incoming society shall be placed on a separate list and invited to all meetings of the section.



4. A section chairman and secretary shall be elected by the section. The chairman, by virtue of his office shall be an Honorary Vice-President of the American Psychiatric Association.

5. The section shall always be represented on the Council and on the Program Committee.

6. If funds are transferred to the Council of The American Psychiatric Association by the incoming society, the funds shall be devoted to purposes specified or for purposes in accord with the objects of the donating society.]

#### ARTICLE IV.

*When another national society with interests similar to those of this Association shall express a wish for an organic union and when this union shall be acceptable to this Association, the following plan shall be adopted:*

1. *A Section of The American Psychiatric Association shall be established and appropriately named.*

2. *The medical members of the incoming society who meet the requirements of Article III of the above Constitution, shall become Associate members, Members, or Fellows of The American Psychiatric Association.*

3. *The lay members of the incoming society may remain as members of the Section and shall be placed on a special mailing list but shall not become members of the Association.*

4. *A section chairman and secretary shall be elected by the section. The chairman, by virtue of his office shall be an Honorary Vice-President of The American Psychiatric Association.*

5. *The section shall arrange its own program with the cooperation and approval of the Program Committee of the Association.*

6. *If funds are transferred to the Council of The American Psychiatric Association by the incoming society, the funds shall be devoted to purposes specified or for purposes in accord with the objects of the donating society.*

#### [ARTICLE V.]

[When any state or provincial psychiatric society or a psychiatric society representing a geographical division of the United States

or British America shall signify a desire to become a district of The American Psychiatric Association and when this shall formally be accepted by this Association the following plan shall be adopted:

1. The state or local district shall be subject to such regulations relating to reorganization and management as may be made by The American Psychiatric Association from time to time.
2. Local organizations shall be allowed to include members who are not eligible for membership in the Association and shall in general be allowed a wide latitude in their organization.]

#### ARTICLE V.

*When any state or provincial psychiatric society or a psychiatric society representing a geographical division of the United States or British America shall signify a desire to become a district of The American Psychiatric Association, and when this shall formally be accepted by this Association, the following plan shall be adopted:*

1. The state or local district shall be subject to such regulations relating to reorganization and management as may be made by The American Psychiatric Association from time to time.
2. Local organizations shall be allowed to include members who are not eligible for membership in the Association and shall in general be allowed a wide latitude in their organization.

#### ARTICLE VI.

*When any group of not less than twenty Fellows or Associate members shall present to the Secretary in writing, an application for a section to discuss stated topics or to have some special program, the Secretary shall present the matter to the Council. If approved it shall be presented to the Association for its action. Upon approval of the Association the following plan shall be adopted:*

1. A section of The American Psychiatric Association shall be established and appropriately named.
2. A section chairman and secretary shall be elected by the section and the chairman shall become an Honorary Vice-President of the Association.

DR. S. J. BECK.—Appointment of Dr. S. J. Beck as Research Assistant in Psychology, Department of Psychiatry, Harvard Medical School, for the year 1932-33 is announced. The appointment will make it possible for Dr. Beck to continue his researches into personality by means of the Rorschach technique. Dr. Beck has resigned as Senior Resident Psychologist at the Boston Psychopathic Hospital, where he has been since 1929.

## Abstracts and Extracts.

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*A Study of the Capillary Circulation in the Affective Psychoses.* N. A. SHEVELEFF. (*Zhurnal Neuropatologii i Psichiatrii*, 8:53, 1931.)

The capillary circulation was studied in 21 cases of depression, 13 manics, 11 hypo-manics and three mixed cases, altogether 48 patients. The capillary bed of the finger at the junction of the nail was studied with the aid of the Zeiss binocular capillariscopes. The patients were examined in the morning and again in the evening. In the depressions the following observations were made: The extremities were cold, moist and cyanotic. The capillaries were seen very easily. The loops were thickened and widened. There was a definite retardation in the rate of flow and there were frequent aneurisms. There was some diapedesis through the capillary wall. Giant capillary loops were seen. In the 13 manic cases there was no stasis of blood. The extremities had normal color, aneurisms were not seen. Capillary loops were not elongated. The cases were also studied by injection of methylene blue into the field of vision. In normal patients the methylene blue disappeared within two hours, whereas in depression it took six hours for the disappearance of the dye, but in the manics the dye disappeared from one hour to one and a half hour.

Injection of pylocarpine and adrenalin intradermally, resulted in the following: When the capillaries were already dilated injection of pylocarpine gave no results, but injections of adrenalin resulted in a marked vaso-constriction with improvement in the circulation. The same results were obtained with administration of atropine. In those cases where the capillaries of the nail bed were constricted, injection of adrenalin gave no results but injection of pylocarpine resulted in marked dilatation of the capillaries with formation of aneurisms. This only lasted from 20 min. to one hour.

The author believes that the capillary picture is different in the various types of affective psychoses. The author correlates this with the blood sugar content, calcium, adrenalin, and potassium, the metabolism of which is regulated by the glands of internal secretion. The author feels that the vegetative nervous system is definitely involved in the affective psychosis and that we are dealing with a special vaso-neuronic diathesis or a dysergia of the central nervous system.

KASANIN.

*Treatment of Schizophrenia with Malaria.* P. A. MINNOVICH and A. I. DORSHT. (*Zhurnal Neuropatologii i Psichiatrii*, 7:43, 1931.)

Present psychiatric literature contains numerous favorable reports on the treatment of schizophrenia with malaria. The first problem the author had to solve was whether the blood of paretics treated with malaria could be used

for inoculation of the schizophrenics. As a matter of fact previous experimental work showed that spirochaetes disappeared from the blood after it has been chilled in the ice box for 20 hours. For this purpose the author inoculated schizophrenics who had a negative Wassermann with the blood that had been chilled for 24 hours. One hundred and three patients were treated, 57 men and 46 women. Only in 7.7 per cent were the inoculations unsuccessful. During the paroxysms, malaria itself was responsible for a positive reaction of the blood in 19.4 per cent of the cases, Kahn test was only positive in 2.8 per cent of the cases. After termination of the treatment with malaria all bloods became negative. Most of the patients were young men and women in their 20's and 30's with a disease lasting from 2 to 8 years. During the paroxysm of malaria a remarkable transformation took place. The patients acted like other sick people. They became interested, keen, sociable, less impulsive and spoke freely about their problems. The improvement lasted during the treatment with malaria but soon tapered down to its previous level within two to three months. In a small number of acute cases the results were much better with an improvement in 50 per cent of the cases. The author feels that malaria would be of benefit only in recent cases.

KASANIN.

## Book Reviews.

*Maternity Handbook.* By the Maternity Center Association, New York City.  
(New York and London: G. P. Putnam's Sons, 1932.)

The text for the Maternity Handbook was carefully prepared by Anne A. Stevens and it is suitably illustrated by Margaret Ayer.

It is a non-scientific treatise written for the benefit of an average group of parents, and everything has been done to make the volume acceptable to them. It is small in size (5 x 7½ inches), light in weight; the type is large and the well-chosen cloth is in plain, delft blue. Further, it is not too long (178 pages); it is easy to read, and so priced that it is within the grasp of the majority.

There has been a wealth of experience behind the preparation of this manual such as one would expect from an Association as keenly active as the New York Maternity Center, working in a community as large as the city of New York. Only the information which has become valuable through repeated usage in the last fourteen years is presented for the perusal and guidance of the public.

The first chapters, apparently written with the intent of making them intelligible to and appreciated by the masses, are almost too simple and sentimental. The instructions given under the biblical caption, "The Ten Commandments for Pregnant Mothers," as well as the remainder of the text, must, however, be commended for it lucidity, completeness and practicability.

Particularly noteworthy is the last chapter devoted to child training. So many texts of this nature avoid this very essential subject. Adequate instruction is given in consistent routine for play, sleep, feeding, toilet and general habit training. From the psychiatric viewpoint, one would rather not see the few paragraphs given to psychiatry listed under "The Baby's Things." With the urgent demand for preventive psychiatry in the community to-day, a whole chapter dealing with this subject would be an advantage.

At a time when the maternity death rate is becoming rather alarming in America, this useful, sane guide is indeed welcome. The medical man will feel quite free to recommend it to his patients, and it will provide the public health nurse with a language with which to reach her clients.

R. MACLACHLAN FRANKS,  
Toronto Psychiatric Hospital.

*Klinische und Vererbungsmedizinische Untersuchungen über Oligophrenie in einer Nordschwedischen Bauernpopulation.* BY TORSTEN SJÖGREN.  
(Copenhagen: Acta Psychiatrica et Neurologica, Supplementum II, Levin and Munksgaard, 1932.)

To be accorded an opportunity of reviewing Torsten Sjögren's monographs is always a source of pleasure. His work is outstanding in accuracy of detail

from the first selection of material and technique to the final conclusions. The latter are based on critical evaluation of findings and are not in excess of demonstrable facts.

The present monograph is a systematic, clinical and genetic study of oligophrenia in a small isolated farm population in north Sweden. This group of people has had little contact with the outside world, due to various geographical and topographical factors, resulting in intermarriage and in a lowering of social standards in general. Dr. Sjögren personally investigated the village records covering a period of thirty years. This gave him information on vital statistics, immigration, emigration, and the number of cases of mental defect in the community. Further, he visited, took histories and examined the relatives and families of the selected material, as well as the individuals themselves.

The author found 52 cases of oligophrenia belonging to 34 families, for whose ancestors kinship could be partly demonstrated. The type of defect is described as connatal and stationary. The mental age of these cases was between the third and sixth year; they were incapable of learning to read, write or do simple reckoning. Sometimes they showed some ability to carry out simple routine tasks. Their speech was dysarthric and agrammatical. Neurologically they showed an almost constant, stiff, pithecoïd deportment with diminished or no movement. Their walk was slow and heavy. Somato-neurological and ophthalmoscopic findings were negative. Epilepsy was infrequent and histological examinations of the brains of five cases were negative.

From the hereditary standpoint Dr. Sjögren indicates that with a high degree of probability oligophrenia follows a recessive and monohybrid course. The preponderance of male patients, and the somewhat low Mendelian figures led the author to advance the following hypothesis.—“The disease is partly caused by a rare autosomal gen, partly by a sex specific gen which has a certain frequency in the population. The accuracy of this hypothesis cannot, of course, be verified; it is, however, an entirely satisfactory explanation for these two conditions.” Finally, it was noted that 53 per cent of the mothers of these cases gave a history of consanguinity in their families, compared with 14 per cent in the fathers' families. The writer concludes from this, “that the diathesis is more readily carried over by mothers than by fathers, or that it manifests itself more easily when it is carried over by the mother.”

The bibliography is very complete, and following this there are some valuable and interesting photographs, genealogical charts and tables. The work will be appreciated by all the profession, but particularly by those devoted to the study of heredity. It is only by repeated studies of this nature that sufficient statistical data will be massed to make the conclusions reliable.

R. MACLACHLAN FRANKS,  
Toronto Psychiatric Hospital.



*Die Epileptischen Erkrankungen. Ihre Anatomischen und Physiologischen Unterlagen sowie Ihre Chirurgische Behandlung.* BY PROF. FEDOR KRAUSE und DR. HEINRICH SCHUM. (Stuttgart: II Hälfte. Neue Deutsche Chirurgie, von Ferdinand Enke, 1932.)

This is the second volume of the rather exhaustive study of epilepsy, the first part of which was reviewed in the January issue of the JOURNAL. It consists of four chapters, in which diagnostic considerations, surgical and medicinal treatment and social considerations are discussed. In the first chapter, current diagnostic views, such as metabolic disturbances and toxic factors are considered. Considerable attention is given to the differentiation of epilepsy from hysteria and the various modern methods of induction of convulsive seizures are described. Special attention is given to the hyperventilation method, the compression of both carotids and the administration of cocaine for the artificial production of an attack. Surprisingly, the authors make no reference to the so-called "affect epileptic" attacks and one may state generally that the psychiatric aspect is rather neglected. They further discuss, at great length, the symptomatic epilepsies, the infantile cerebral palsies and the traumatic epilepsies, going into the most detailed clinical diagnostic considerations. The mechanical diagnostic methods are also thoroughly discussed especially encephalography. It is interesting to learn that the authors are inclined to rely rather on their own clinical ability than on mechanical methods. They state, however, that in the hands of experienced men the encephalographic method may sometimes help when all examinations seem to indicate the diagnosis of the so-called "genuine epilepsy." They refer, of course, to the obscure organic brain conditions that offer very few neurological signs.

In the second chapter the authors discuss the surgical interventions in the "idiopathic" and symptomatic epilepsies and rightfully point out the lack of rational in the surgical treatment of the former type. Foerster's conception of the *Adversivfelder* and the excision of the same are recommended in somewhat half-hearted fashion. They then describe in great detail all available operative techniques, especially of the various operations in symptomatic epilepsy. This is the most exhaustive part of the volume but of major interest to neuro-surgeons only.

The chapters on medicinal treatment and social considerations are rather sketchy; however, one can hardly expect more as our present armamentarium can be enumerated in a half dozen lines or less, and as sociological problems in epilepsy are practically reduced to segregation of the psychotic patients and advice to the non-institutionalized epileptics regarding such matters as occupation, celibacy, general and mental hygiene.

The first volume of this work was recommended by the reviewer as the most extensive study of the problem of convulsive states. The second volume may be recommended for the profundity of its surgical considerations especially in the symptomatic epilepsies and as such, will be of particular interest to neuro-surgeons. Both volumes are illustrated with numerous tables, many of them in color. Each chapter is supplied at the end with a most carefully prepared bibliography.

J. NOTKIN.

## **In Memoriam.**

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### **MICHAEL OSNATO.**

Sudden and unexpected death took Dr. Michael Osnato from active neurologic practice and productive participation in American neurologic activities on June 15, 1932. He had left New York hardly a week before for a short vacation in Germany and died suddenly on the train between Bremen and Berlin.

Michael Osnato was born on Nov. 22, 1886, in San Paolo Albanese, Italy, and came to this country with his parents while still a small child. He received his education in the New York public schools, and after being graduated from the DeWitt Clinton High School he entered the College of Physicians and Surgeons, Columbia University in the fall of 1902. He was graduated in 1906 with the degree of M. D.; he served internships in the Bellevue and Italian hospitals and then went into general practice.

In 1914, he first came in contact with neurology and psychiatry when he was appointed medical examiner in the bureau of deportation of the State Hospital Commission. In 1916, when he relinquished this position, Dr. Osnato decided to devote himself to neurology and secured a position in the Vanderbilt Clinic, department of neurology. Here he made the most of the opportunities offered him to learn neurology both in the clinic and in the laboratories of the College of Physicians and Surgeons. His progress was rapid as his determination to learn was genuine.

When our country entered the war Dr. Osnato at first remained at the College of Physicians and Surgeons, helping out with the neurologic teaching until he entered the army in the early part of 1918. In July of that year he was sent abroad with the rank of captain as neuropsychiatrist to Base Hospital No. 102. At first he saw service with that hospital in Vicenza, Italy, and later was detached to become consultant in neuropsychiatry to the A. E. F. in Italy. He saw considerable service both at the front and in base hospitals until the end of the war. For his military service he was

awarded by the Italian Government, the Croix de Guerra and the Order of the Italian Crown.

In February, 1919, Dr. Osnato was discharged from the army and returned to his neurologic practice and to his work in the Vanderbilt Clinic and the College of Physicians and Surgeons. In 1920, he first allied himself with the New York Post-Graduate Hospital, and, in 1926, when the service there was reorganized, he was appointed professor of neurology and director of the neurologic department, which position he held at his death. His interest in his Alma Mater he maintained to the end, and from 1930 on he held the position of clinical professor of neurology in the College of Physicians and Surgeons.

Dr. Osnato was always active in the neurologic and psychiatric societies. He was a member of the local and national societies and the New York Academy of Medicine. In 1930-1931, he was chairman of the Section on Neurology and Psychiatry in the Academy. He was elected to membership in The American Psychiatric Association in 1915 and in the American Neurological Association in 1920.

Michael Osnato left behind many friends to miss him. He made friends readily, and those he made he kept. His was a life of struggle. It was the story of an immigrant boy who worked his way up to recognition by his innate personality characteristics and his ability for hard work. The position he attained was all the more deserved because it was self-earned. His friends regret the most in his passing the fact that he died while still young, before he had reached what they all hoped would be his most productive years in the maturity of his career.

LOUIS CASAMAJOR, M. D.

#### WALTER MURRAY ENGLISH.\*

The news dispatch from England relating the death on the eighteenth of May of Dr. Walter Murray English, President of this Association 1930-31, carried a sense of shock and loss to all those who have known him personally and were in frequent contact with him, as well as to those who had learned to know him as one of the most active and devoted officers of the American Psychiatric Association.

\* An excellent likeness of Dr. English appeared in the JOURNAL, July, 1931.

Dr. English had been in poor health for the past year or longer, although he refused to restrict his activities, and carried on cheerfully and courageously to the end. Few of the members who attended the meeting in Toronto in 1931, at which he presided with such wisdom and dignity, realized that Dr. English was not a well man; but those of us on the local committee were greatly concerned lest he might overtax a greatly damaged myocardium.

On one occasion, following a meeting of the Committee of Arrangements, he told the writer of his plans to retire from active service, and go to England and the south of France to rest, and to attempt to regain his health; adding that it was very doubtful if he would be alive to return to Canada this spring as he hoped to do. He knew his condition only too well, but there was no sign of fear or anxiety; and we have no doubt that he lived his last day on earth as bravely as any day throughout his entire life.

This personal courage was one of his most distinguishing virtues and was the admiration and envy of those of us who knew him intimately. It was well demonstrated on another occasion some years ago at a disastrous fire at the Ontario Hospital, Hamilton, of which he was the superintendent. Taking a line of hose, he ascended a ladder, and with no regard for his own safety, he directed the stream of water into the conflagration until the fire was extinguished.

Dr. English was born at Goderich, Ontario, the 13th day of November, 1861, his parents being the Rev. Franklin English and Hester Ann Wrong. He was educated in the primary and secondary schools of London, Ontario, following which he received his medical education at Western University, London, and the University of Toronto, receiving the degree of Doctor of Medicine in 1886. He followed post-graduate studies in England, and on returning to Canada began the practice of medicine in the city of London, in the autumn of 1887.

He was a successful practitioner, later specializing in surgery, and was surgeon to the Grand Trunk and the Canadian Pacific Railways. He was for a number of years lecturer in Sanitary Science at the Western University Medical School, and was also a member and later chairman of the Board of Health of that city.

He was married October 19, 1893, to Elinor Clarke, daughter of Dr. Clarke, Sheriff of Port Arthur, who with two sons, Walter

Reginald Clarke, and Harold Franklin, survive him. The marriage was a very happy one, Mrs. English's devotion and sympathetic understanding of the many difficult problems arising during his long and active career being responsible for much of the success, which attended his efforts.

In 1908 he was offered, and accepted the superintendency of the Ontario Hospital at Hamilton, a position which he filled with distinction for twenty years. He was always on the alert for new forms of treatment, and his psychiatric emphasis was applied therapeutics, so that his patients were always assured of receiving the benefit of such treatment as might aid their restoration to health. This interest in therapeutic measures was indicated even in his most recent contributions, such as the paper he read before this Association in 1928 on the Manganese Treatment of Dementia Præcox, and in his Presidential Address delivered at Toronto in 1931 on the treatment of mental defectives.

In 1927 he was asked to assume the superintendency of the Ontario Hospital at Brockville, made vacant by the death of the late Dr. Peter MacNaughton, and gave splendid service there until his resignation and retirement on superannuation in the autumn of 1931.

Always keenly interested in sport, he did much to promote football, cricket, lawn bowling and curling, in the last two of which he was personally proficient.

He was one of the founders of the Ontario Neuropsychiatric Association, and was elected President of that organization in 1924. Of all the honors which came to him during his long and successful career, there was none he prized more than that conferred on him by the American Psychiatric Association in electing him to the Presidency in 1930, an honor which was particularly gratifying to his fellow Canadians.

In his passing this Association loses an officer who ever labored for its advancement; his wife and sons lose a devoted and affectionate husband and father; his colleagues in the medical profession lose a distinguished representative, and one on whom they could always rely; the mentally ill of the Province of Ontario lose a friend whose chief interest for a quarter of a century had been the amelioration of their suffering.

He died at the home of a sister, Mrs. H. Gerrans at Oxford, England. His body was cremated, and the interment was made at Simcoe, Ontario. Peace be to his ashes and to that brave spirit that now rests from its labors.

On May 11, just a week before the death of Dr. English, he dictated the following message to the Association, and addressed it to the President, but unfortunately it did not reach him. It is being reported here as an indication of the deep interest Dr. English had in the welfare of the American Psychiatric Association:

I send my greetings from Oxford, and if I cannot be with you in body, I will be in spirit, and wish you every success for what I feel sure will be the best meeting ever.

(Sgd.) W. M. ENGLISH.

GEORGE H. STEVENSON.